spark

committee for social responsibility in engineering

spring 1974 - vol.4 no.1

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SPARK would like to encourage communication between otherwise isolated individuals and groups and indeed to encourage the formation of groups throughout the country. If anything is happening out your way, let us know, your experience may be of use to others. SPARK is particularly interested in news of job actions, suppression or misuse of scientific and technical information, discontent among technical workers, layoffs, and any interesting contracts that your company is handling (military or otherwise).

Any individual, groupuscule, group, tendency, or faction is invited to send us news items, full articles (news or analysis). There are three categories of reader solicited material:

1) News Items
Send us the raw information and tell us how to get in touch with you. We do the writing and check with you for clarification if necessary.

2) Essays
Submit typewritten double spaced manuscripts on 8 1/2 by 11 paper.

3) Columns
For a nominal fee (payable in subscriptions or otherwise) we will print your articles under your logo. Send us 8 1/2 by 11 paste - ups. Nothing will be changed but articles are not protected against rebuttal, contradiction, or contentious objection.

Columns and articles reflect the opinions of the originating individuals or groups who are not necessarily in mutual philosophical accord. Unsigned articles are written by and reflect the opinions of the SPARK staff.

Let the sparks fly!

Table of Contents

Editorial and Production Staff for this issue:

Alan Horowitz
Paula Horowitz
Annette Kitchens
Anne London
Don Osias
Roy Samras
Sam Schiffer
Jack Tucker
Ann Werntz
Ted Werntz

CSRE STATEMENT OF PURPOSE:

Engineers face today increasing unemployment and job insecurity, conditions that stem from misguided national priorities. Thousands of engineers feel that their engineering talents are misused in both civilian and military projects, and believe that the constant development of weapons technology spells ultimate disaster for mankind. The COMMITTEE FOR SOCIAL RESPONSIBILITY IN ENGINEERING seeks to challenge the present orientation of engineering and to explore ways in which engineering skillls can be used to solve the obvious and growing ills of our society. It is essential that we end unemployment and pollution and provide adequate medical care, housing, education, transportation and communication systems for all people.

We invite you to explore these matters with us.

From GE To The Syracuse Peace Center

by Chris Murray

I work for subsistence wages as a staff member of the Syracuse Peace Council. A year ago, I was a computer scientist in the military departments of General Electric. How did I get from there to here?

As for many Americans, the Viet Nam war was a catalyst for me. Admitting to myself that the US is committing genocide was a shock that I could not assimilate. Then came all the why's: the why of war, the why of human exploitation by governments and corporations.

It was always very tempting to abstract myself and my work from the questions. I'm sure this defensive syndrome is familiar to many of you: ... after all, I had enough of a conscience to be appalled by the war, and I was out in the street vigorously opposing it; besides, computers and software systems are fun, and drastic departure from what most people are willing to accept is scary; am I responsible for all applications of the computer software I develop? and anyway, GE is in the defense business, not war.

There was a certain stimulation from loudly condemning US policies from within a GE military department. Decorating my office walls with antiwar posters, wearing a black armband during moratoriums (but I still went to work), eventually getting to the point of leaving work to attend demonstrations,marked a difference between me and my colleagues. However, the sense of isolation grew oppressive. Everybody surrounding me was able to rationalize the cause of the military -- was I crazy? To make things worse, I felt a chagrin when working with antiwar activists. I didn't fit into either group.

It's hard for me now to believe that I spent nearly four years in this dichotomous state. I don't know which was worse -- the period of mental/emotional floundering, or that of realizing I couldn't continue but still needing to cling to what appeared as security. During most of this time, I was working for the Aerospace Electronics department with a group building a family of airborne computers, the "GEMIC" series. My responsibilities included the design and development of the support software -- the machine language assemblers and simulators. There was as yet no specific buyer for our product in those days of development, and I was able to salve my conscience as long as the end product of my work remained invisible to me. But I often helped write proposals while secretly hoping we would never win the contracts. (I still wince when I open the Armed Forces Journal, and see a full-page color ad for those computers with their "comprehensive software packaging".)

The World-Wide Command and Control Military System (WWCCMS) proved to be a real turning point for me. This monstrous computer system designed to police the world illustrated to me to what ends I and my "products" could be put. Here was the contradiction -- a general purpose software operating system, an innocuous tool, utilized in an offensive military system. I began looking for alternatives. I myself could not remain with a company as involved with the military as GE and attempt to "conscientiously select" my projects. (But for those of you who find that course is practical, it could be an effective means of educating your coworkers.)

Concurrently with all this, I was being steadily drawn to income tax resistance[1] as a clear moral statement against the war. I had thought that all that was inhibiting me was the conditioned fear of disobeying authority. But I also could not honestly justify that action while I worked for GE. The stress of the war finally pushed me into resistance and quitting was bound to follow. The Peace Council offered a staff position, and suddenly it all became simple.

All important to the clarity of the situation was the strong support of pacifist friends. One in particular encouraged me to communicate to those people I had worked with. The following letter was the result.

February 6, 1973

Dear Friends,

Having resigned my position at General Electric, I feel compelled to write this personal statement to the many of you with whom I have enjoyed professional contact these fifteen years. I want to explain briefly the personal circumstance of my leaving, my thoughts and feelings that may be relevant to some of your concerns.

My leaving GE is central to a broadreaching decision to leave industry and the computer field to adopt an alternate mode of living. I am convinced that true peace and total freedom of the human person is attainable only through changing attitudes and social structures. I have found that for myself, the pursuit of such goals is irreconcilable with my being employed by war-related industry. Having been involved in the peace movement for several years, I am joining the staff of the Syracuse Peace Council. I am well aware that many here have decried many aspects of the Indochina War, and that we in HMES tell our-

selves that we are concerned with products of defense and not necessarily those employed in such wars. I also understand the position of many, that cold war weapons systems development creates a strategic posture necessary to maintain the balance of world power. Personally, I am no longer able to accept this rationale. Certainly money is being allocated for products of war that should be spent more constructively; more basic, such channelling of our resources and energies creates in this country a war mentality that tolerates, even sanctions, Viet Nams.

In any evaluation of this sort, it is a prerequisite to abstract the corporation from the people in it. The professional technical class to which we belong contains a wealth of technical skill and creative ability. Yet companies are making profits by using our talents for war. The gross annual sales figure of GE in 1971 was surpassed only by 4 corporations and the gross national product of 38 countries. Our sales were greater than the entire GNP of relatively developed countries as Chile, Israel, and Egypt. Profits translated into roughly $1500 per employee. Could not all this wealth and power be directed to the betterment of the human condition? I realize there is no simple solution; that conversion problems pose a technical challenge. Lobbying by corporations for government subsidies for conversion research rather than overruns is a start.

A growing movement among our professional class is beginning to challenge the present orientation of engineering, to explore ways in which talents can be used to solve the obvious and growing ills of our society. Alternate power sources, pollution control, medical applications, transportation systems for all people are problems to be weighed against an unbridled development of weapon technology. The need for us to assume personal responsibility for our professional work is self-evident. This requires organizing to reassert control over how our talents are utilized. The Committee for Social Responsiblity in Engineering is a national organization formed two years ago to help individuals and groups concerned with the social implications of technology. It provides communication through its periodical, SPARK, and is worthy of your attention.

I realize that very few people are in the personal situation that I am, one that allows the freedom of making a full commitment to any cause. This very freedom brings a deeper responsibility to act. I only urge you to reassess your responsibilities within the corporate system. I hope that this "view from my computer" is not misconstrued as moralistic or individually censuring, but taken as it was meant, parting comment from one that enjoyed a relationship with you and wishes you well.

Peace,
Chris Murray

The response of co-workers and management to my letter was almost encouraging. I was summoned to discuss my leaving GE with a higher-level manager whom I had never met. (This attention was not so much a personal tribute, but more a result of upper-management's growing awareness of relatively highly-placed women in their work force.) The general tone of the meeting was set by his question to the effect "what's a nice engineering-type girl like you doing being a pacifist?" He seemed to need to explain his rationale for working in military industry -- perhaps in some small way he had been challenged. The usual arguments for strategic weapons research were trotted out: the arms race bought time with Russia, etc.; but he also wanted to hear the pacifist's point of view. He admitted that he would really like to be using his talents in electronics-based medical applications -- at the end of his life he would feel that he had really helped people -- but then he claimed that his individual wants must be put aside; it was his <u>obligation</u> to work in Defense!

The surprising reaction of many of my co-workers was envy -- envy of someone's being in a personal situation that permitted escaping from the System. During my last days of work there, many told me of unrealized ambitions, dreams chucked because they were incompatible with what society expected. My leaving helped to surface (momentarily) the dissatisfactions many had -- dissatisfactions not explicitly with working for GE or corporations involved in war-making, but with a common lack of control over their own lives.

For me, leaving GE was a very right thing. The staff of the Syracuse Peace Council is a working collective, and we all feel very free. We are able to follow our own consciences and make our own decisions. One of my responsibilities at the Peace Council is a program aimed at confronting and exposing the power of the military-industrial complex, specifically through the GE-Project[2] and the B-1 Bomber Peace Conversion Campaign. One disadvantage that limits what we can accomplish is that we're working on the outside of these monster corporations. We can be truly effective only with the support and cooperation of those of you still on the inside.

<u>Abbreviations</u>: HMES: Heavy Military Electronics Systems

<u>References</u>

1. War Tax Resistance (WTR), National Office, 912 E. 31st St., Kansas City, Missouri 64109.

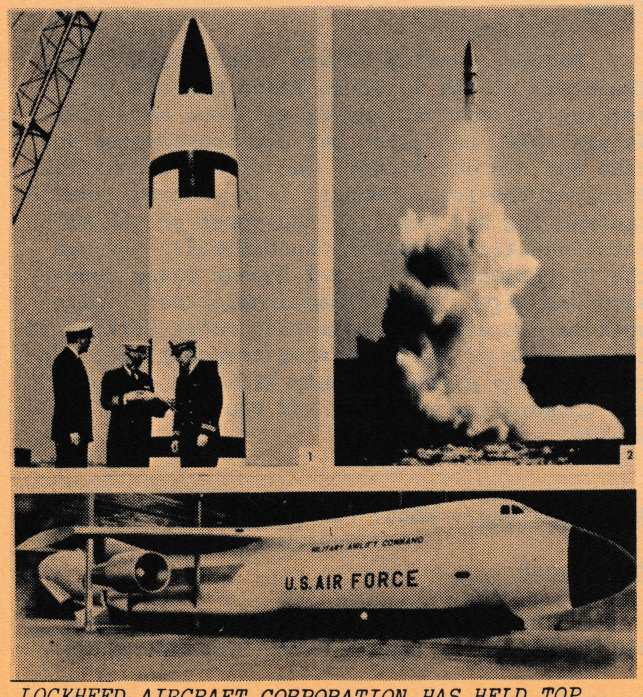
2. GE Project; Syracuse Peace Council, 924 Burnet Ave., Syracuse, N.Y. 13203 or AFSC, 48 Inman St., Cambridge, Mass. 02139.

The Lockheed Ad Hoc Group of Engineers

by Bob Aldridge

In our quest for social responsibility we try many experiments and not all succeed. But ongoing action is not simply a case of building on our successes and chalking the failures up to fate -- we must understand why certain endeavors do not yield the desired results. One of these experimental fizzles occurred during my time at Lockheed when I helped organize a group of engineers to study alternative uses of aerospace technology. We started out with zest and ended in a flop. I will try to analyze what went wrong because there is an important application for this type of action today.

Lockheed Missile and Space Company (LMSC) in Sunnyvale, California is a subsidiary of Lockheed Aircraft Corporation (LAC) which has for many years held top spot in defense contracting. Despite its high ranking in military sales this aerospace giant has been beset by financial problems and narrowly escaped bankruptcy in 1971. First the ill-fated C-5A program at the Lockheed-Georgia facility and then the trouble-plagued L-1011 commercial jetliner in work at the Lockheed plant in Burbank cut deeply into corporate reserves. With another $20 million loan taken out this January, LAC has now borrowed $620 million of its $650 million credit agreement with banks. LMSC is the one solvent major subsidiary with the Poseidon missile in production and the Trident contract cornered.



LOCKHEED AIRCRAFT CORPORATION HAS HELD TOP SPOT IN DEFENCE CONTRACTING

Several years ago at this Sunnyvale plant a layoff was in progress; one of those occupational hazards which surface periodically in the defense industry. As my wife, Janet, was reading about hundreds of engineers being out of work she lamented that their talent could not be used to meet human needs. This triggered an idea in my head which I discussed with a friend of mine, also a Lockheed worker. We decided to form a group to research other applications for the know-how and techniques we had developed. That was the inception of what we informally called the Lockheed Ad Hoc Group of Engineers.

One stipulation we asked of all involved was that the objective be humanitarian -- we did not wish to taint noble work with the thought of personal gain. Engineers invited to join were those we thought would relate to this ideal.

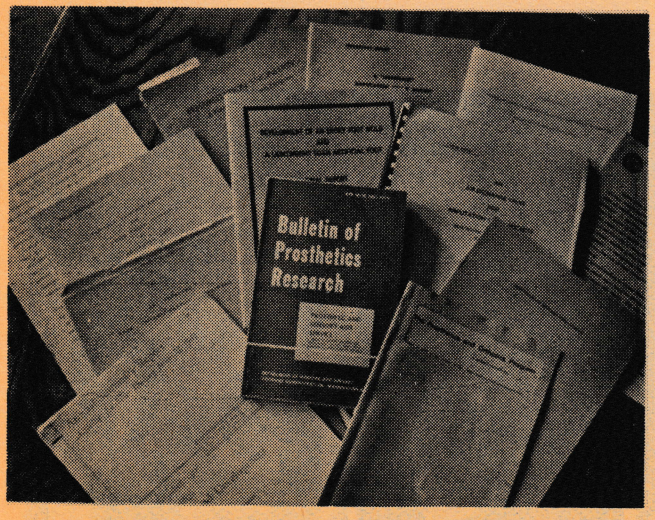
We grew slowly but with dedication -- at least that is how we hoped it was progressing. Our meetings were held in a small steak-and-beer establishment during their slack hours. Some attempt at brainstorming was made and each of us was supposed to do homework between meetings. I became interested in prosthetics -- substitutes for body parts such as artificial legs and arms but also including surgical implants -- and wrote letters to various agencies requesting information. But it seems that even people working at humanitarian professions are not too anxious to share their knowledge as I received only one reply.[1] But that singular reply was from a very warm person, the Director of Prosthetics Research at the Oakland Naval Hospital. He invited our group -- by now almost twenty people -- to visit their laboratory. We arrived at six-thirty one stormy night after work and were conducted on a tour of their establishment. What we thought would be a quick briefing lasted until ten-thirty that evening. It was obvious that much preparation had been performed in anticipation of our visit. The research director and the bio-mechanical engineer gave of their own time as they did on several subsequent visits through which we acquired a good feel of the technology of materials and processes they lacked. I thought our engineers would leap at the chance to sink their teeth into these needs but several months later we still had nothing to report. Thinking stronger direction was needed, my friend and I requested certain individuals to look into specific improvements which fell within their expertise. This also failed so we tried pushing into other areas, thinking that possibily prosthetics did not appeal to them.

By this time Lockheed's work load was pick-

ing up and our group began to dwindle. Some told me they just didn't have time anymore as their job was keeping them busy and things were looking stable again. Soon there was no one left except my friend and me. The real reason for interest, in spite of assurances to the contrary, was based on economics. We gave up with a feeling of disappointment; we had entertained strong hopes that a project based on moral intentions would flourish.

Now, since I have ceased to work on military contracts and have experienced those sensations of insecurity in my own life, I can look back and understand why the Ad Hoc Group did not jell. The first reason was our mistake of putting morality and economics into separate boxes. The idea that profit implies corruption is an overreaction to the sad state of our present society. The reason our current system of economics fosters so much injustice is that it is not good economics. But, it being the only economics we know, we assume there is nothing better -- we feel that breadwinning is a necessary evil and charitable works must be accomplished during our free time. These suppositions are completely false and we must see beyond them. There is no reason why a person should not earn his living doing an enjoyable work of service. Contrariwise, there are valid reasons why he should -- why he must demand that his talents be used for the good of mankind and not for death and oppression. Gandhi's works on this concept are very cogent:

> "True economics never militates against the highest ethical standard, just as all true ethics to be worth its name, must at the same time be good economics.... True economics, on the other hand, stands for social justice, it promotes the good of all equally, including the weakest, and is indispensable for decent life." [2]



WE DID HOMEWORK BETWEEN MEETINGS OF THE AD HOC GROUP

PHOTOGRAPHS OF PROSTHETIC ARMS FROM A BOOK USED TO INTEREST ENGINEERS OF THE AD HOC GROUP

And that is one reason why the Ad Hoc Group failed -- we realized that our present fiscal structure was bad and excluded all thought of gain. And that relegated our activities to a spare time endeavor. Some of those involved thought a breakthrough might give them a fulfilling livelihood but since the direction of the group was not geared to achieve this, they went back to earning a living -- there just wasn't time for an activity without a realistic goal.

The second failing of the group was lack of accomplishment. Some success, no matter how small, is needed to bolster morale and spur enthusiasm. The coordinator should make certain there is visible achievement whether it be completion of a small project or attaining definite milestones on a larger undertaking. Engineers relate to this tangible measure of success -- it is extremely difficult to maintain any degree of interest without visibility.

Thirdly, we were trying to blaze the trail by ourselves. We knew of no other group doing what we were attempting. Consequently, we lacked the encouragement associated with a joint effort -- the feeling of not being alone. Communication between groups is invaluable in pointing out fruitful approaches and warning against dangerous pitfalls. Had we known of the Committee for Social Responsibility in Engineering at that time, I am sure a helpful correspondence would have been initiated.

That is the way I see the demise of our experiment. If I were still at Lockheed I might try again, but this time there would be no nonsense about seeking humanitarian uses of technology to promote a full time occupation. And then we would take a small bite at something to

ARTIFICIAL LEG DISPLAY IN THE PICTURE BOOK ON PROSTHETICS

show ourselves we can do what we set our minds to accomplish. As we tackle more formidable research, we would set up definite goals and decision points to be scrupulously completed on schedule. Finally, we would communicate with similar groups through CSRE and SESPA.

You may have noted that these three necessities are all aspects of hope -- hope for economic security through responsible labor bolstered by visible success and a community effort. Our Ad Hoc Group was really looking for the dignity and freedom and security that is not manifested in our present wage-slave existence where personal considerations and family plans are all subordinated to the demands of the job -- where we have become trapped in the degrading task of perpetuating the arms race while most of the world lacks the necessities of decent life. That desire is still there and waiting for enlighted leaders to show the way.

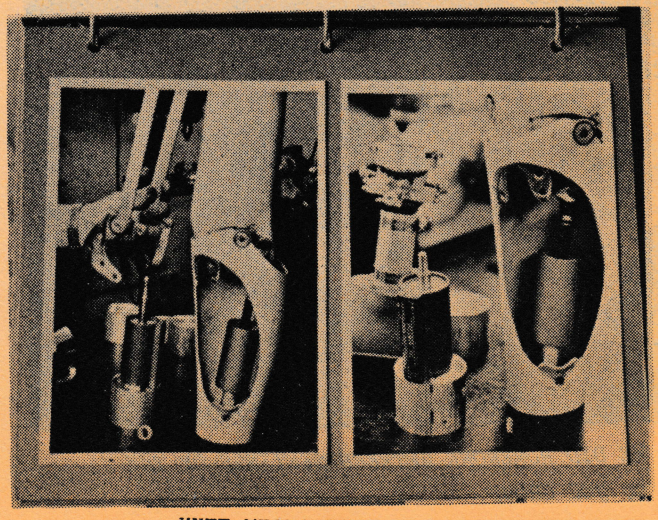
The other evening I was with some people discussing the need to reduce military spending which now consumes two-thirds of our national budget. There was speculation regarding the plight of defense workers who would be out of a job and the subsequent effect on our economy. One person summed up the problem very succintly with the observation that there must be a whole new structure of the economy before this could be done. For years the need to investigate economic conversion has been mouthed in Congressional circles but nothing has been started. No wonder they continue to give the Pentagon everything they ask for -- what congressman or senator is going to vote for a budget reduction that will bring unemployment and economic chaos to his district? To cut military spending without having an alternative would be disastrous. How many engineers are going to be consoled with arguments of morality when they are out of a job and can't support their families? And how moral would it really be to stop spending on military projects if the money is not redirected to alleviate the suffering of so many needy people?

It seems clear to me that economic conversion is not going to start in Washington, at least not for quite a while. But it must start somewhere soon. And if it is not going to start at the top, the only place left is the bottom -- you and me. I am sharing my unfruitful experiment in the hope it will spark ideas on accomplishing this task. I believe the Ad Hoc Group could have been on the right track. With a wiser approach we should be able to start a real movement toward the day an engineer will be able to say, "No, I will not work on any weapons systems, I am too busy doing something to help my fellow man."

REFERENCES

1. To obtain current information on prosthetics research write for the Bulletin of Prosthetics Research from Research and Development Division, Prosthetics and Sensory Aid Service, Veterans Administration, 252 Seventh Street, New York, N.Y. 10001; and for the Annual Summary Report from Committee on Prosthetics Research and Development, Division of Engineering, National Research Council, National Academy of Sciences, Washington, D.C. 20418.

2. S. Abid Hussin, The Way of Gandhi and Nehru, (Bombay: Asia Publishing House, 1961), p. 39.



KNEE MECHANISMS FOR ARTIFICIAL LEGS

Alternate Radio: "The Rest of the News"

by Frank Rosenthal for the rest of the news

Alternate Radio describes a number of people, groups and projects in the field of audio communications whose values and goals differ from and in many cases sharply oppose those of the established mass media. Although FCC regulations theoretically allow and even demand alternate viewpoints and programming, most radio stations are controlled by business interests and it is usually a fight to get alternate radio on the air.

Community owned or sponsored radio stations are one form of alternate radio. The stations are often built, engineered and staffed by volunteers from a given community.. They are usually free of many of the restrictions of commercial stations and are usually more open and progressive in their programmings. Some college stations are in a similar situation.

Also part of alternate radio are several groups which produce taped programs which are distributed not only to radio stations but also to individuals and organizations. The Rest of the News is one of these groups and this article will try to give you a glimpse of alternate radio by describing what it does.

The Rest of the News

The Rest of the News is an independent radio news organization that produces programs for distribution to radio stations, individuals and organizations. Our programs are produced on tape and sent through the mail. Occasionally we also "feed" stories over the telephone.

Our purpose is to provide news coverage of events in the movement for social change and to provide a radical analysis of current issues. Recent program subjects have included "The Energy Crisis" , The United Farm Workers in California, Amnesty for American War Resisters, Wounded Knee and the Liberation Movement in Guinea-Bissau (Africa). The programs emphasize reports and interviews from people who are actually involved in social struggles and only occasionally include "experts" or academics.

The Rest of the News interviews Attica defendants Charles Pennasilie and Mariano Dalou Gonzalez at the Wyoming County Courthouse, Warsaw, N.Y. February, 1973

Rest of the News reporter Joanna Brown talks to Gladys Bissonette during negotiations between the Oglala Sioux and the U.S. government after the Wounded Knee occupation. June, 1973.

We feel that conventional news is seriously biased in support of the present power structure in the United States. Not only does the establishment press control almost all channels of news dispersal, but it passes off its product as objective, leading people to accept its implicit bias as reality. The Rest of the News provides an alternative by reporting on events which are distorted or ignored in the regular press and by often expressing where we stand on the issues that are related to the events we report.

Our style of reporting is another way in which we differ from regular news programs. To many radio stations, news programming is not treated as a meaningful endeavor but as an FCC requirement, to be dealt with by dressing it up as entertainment or by playing it down hoping that listeners will not find it too offensive and change the station. The result is usually a hurried format with no time for any analysis or any personal view of events. The prose is stilted, the voices mechanical and overmodulated, bearing little resemblance to what we normally think of as human speech. The effect is that people who listen to conventional news rarely become involved in it.

By contrast, The Rest of the News makes no bones about the human aspects of our programs. We try to make our speech as normal-sounding as possible, not hesitating to ex-

press emotion and sometimes using music to accentuate the emotional impact.

Some History

The Rest of the News began in the Spring of 1971 in Ithaca, N.Y. when a large group of angry young people from Ithaca, went to the studios of WVBR-FM to protest coverage by the Associated Press of the movement in Northern Ireland.

A set of negotiations ensued during which case after case was presented to expose the myth of the "objectivity" of the wire services. Finally aided by friendly elements at the station, the community group won a demand for regular air time to present "the rest of the news". For the next year and a half, we were completely occupied with producing a daily ten minute program on local national and international events, learning radio skills and equipping a studio.

Then, based on this experience, in November of 1973 The Rest of the News began a national radio news service, to which there are now twenty subscribers. The service consists of a weekly tape, with a feature story, plus short special reports and occasional "phone feeds" on stories as they break. In addition we continue to produce the daily programs on WVBR and to distribute tapes to individuals and organizations.

Working at The Rest of the News

Our work is done without fixed role divi-

RECENT PROGRAMS PRODUCED BY THE REST OF THE NEWS

ENERGY: CRISIS OR CONSPIRACY? A look at the causes and effects of the current fuel shortages -- how the "crisis" came about -- who is responsible for it -- what its relationship is to the oil industry and the environmental movement -- and who it will hit the hardest.

ENERGY AND THE ENVIRONMENT Do we have to make a choice between energy and the environment? The Rest of the News spoke to two ecologists, Murray Bookchin and Barry Commoner, who don't think we do.

BROWN LUNG Only 10% of the textile workers in America's south are unionized. Over 100,000 of them suffer from Brown Lung an occupational disease resulting from cotton dust inhalation. The Rest of the News speaks with a union researcher and a worker who after 24 years in the cotton mills is disabled with Brown Lung.

ATTICA ON TRIAL: THE BROTHERS SPEAK In an attempt to crush the spirit of the Attica rebellion, 59 former Attica prisoners will soon be brought to trial. The defendants talk about the conditions that led to the rebellion and the political context of the trials.

THE ATOMIC ENERGY COMMISSION The A.E.C. is charged with protecting the public interest in the area of nuclear power. But it is also run by those who stand to profit most from the exploitation of Atomic energy.

STRIP MINING IN TENNESSEE A look at the effects of strip-mining on the people of Tennessee and how they are fighting back. The story is told in interviews and songs.

For a complete program guide write: THE REST OF THE NEWS, 306 East State St., Ithaca, N.Y. 14850.

SOME ALTERNATE RADIO GROUPS

Radio Free People produces and distributes tapes of talks, songs, poems, documentaries, and drama concerned with revolutionary social change. The programs are used by radio stations, community groups, schools, and individuals.

Radio Free People
133 Mercer St.
New York, N.Y. 10012
(212) 966-6729

GARC produces a weekly half-hour radio program of radical news, analysis and commentary. Among its recent programs have been tapes on health care, ecology, racism, U.S. corporations and radical alternatives.

Great Atlantic Radio Conspiracy
2743 Maryland Ave.
Baltimore, Md. 21218
(501) 243-6987

The Rest of the News provides a taped news service to radio stations on a subscription basis. It also distributes feature programs to individuals and organizations. It airs a daily program on WVBR-FM (Ithaca).

The Rest of the News
306 E. State St.
Ithaca, New York 14850
(607) 273-4139

Zodiac News and Earth News produce daily dispatches of alternate news in print form for use on radio stations.

Zodiac News Service
950 Howard Street
San Francisco, Calif. 94103
(415) 956-3555

Earth News
24 California Street - Rm. 400
San Francisco, Calif. 94111
(415) 362-3045

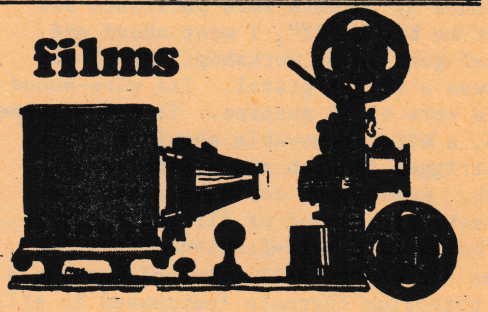
sions. We assume that all persons who want to work are capable of good script writing, interviewing, reading, engineering etc., regardless of the level of ability they start from. We engage in frank criticism of each other in all aspects of our work, from political questions to the technical quality of our programs to the way we relate to each other. Most of us couple our radio work with other political activity. This helps us to keep in personal contact with the events and trends we report.

Although not dominant, engineering has always been an important part of our work at Rest of the News. Those of us with technical experience spend part of our time maintaining the equipment, working on new projects and teaching others. Technical projects now in the works include a teletype receiving station to receive foreign news services such as Prensa Latina (Havana), Vietnam News Agency and Agence-France-Presse, and a low-cost, high speed dubbing system to copy our tapes.

The Future

An important part of the Rest of the News is working with radio stations and other groups on a personal and a political level. We have encouraged exchanges of materials with our subscribers. We have also had contact with most of the groups listed below. And we always encourage people to come up and visit us, whether they are from radio stations or movement groups or are just interested in our work. We feel that the subscription service we have started and the contacts we are forming are the first steps in building a national alternate radio news service.

Note: You can help if you have equipment, time or ideas to donate. Technical assistance is particularly needed by The Rest of the News in the area of the new technical project described in the article. Radio Free People is looking for some help in the area of general technical maintenance.



THE McDONNELL FILM

The McDonnell Film is a political documentary about the effects of the aerospace industry.

The film consists entirely of interviews with people who have had some kind of working relationship with the McDonnell Douglas Corporation or its products. McDonnell Douglas builds the Phantom F-4 and the F-15 fighter bombers which have been extensively used in Southeast Asia.

The film explores what the aerospace industry does to people here and in the Third World in the "name of Freedom" and the interests of profit.

Running time: 27 minutes. Black and White.

Available from either CSRE or the St. Louis Project; #1 Forest Ridge Rear; St. Louis, Mo. 63105

Using Engineering in the Movement

by Brad Lyttle

About 20 years ago, I owned and operated a business designing and manufacturing medical research equipment. This involved engineering, but in other respects my background as an engineer is atypical, for I never received formal training in any field of engineering. Experiences that led up to the business bear on my subsequent decision to abandon it and work full time in the movements for peace and social and economic justice.

As a youngster and teen-ager, I showed considerable talent in engineering and physics. At about 12 I built a stroboscope and demonstrated "freezing motion" to my freshman high school class. Once, while using the scope in my room at home, I forgot that it was on and inserted a screwdriver into the hub of a centrifuge to tighten a setscrew. The results were shattered test tubes and an inky-black solution all over me and the walls of my room.

Like many boys, I became interested in firearms, and since my parents were pacifists and wouldn't let me buy a "22", I went ahead and built several guns in my workshop. My finest production was a target pistol. Its wire-wound barrel had a core of ¼" gaspipe. It had a shaped wooden grip, a wire, removable shoulder stock, adjustable trigger tension and sights, and a safety catch. Ammunition could be a ball, a finned projectile, or shot of different grades. I cast the balls in a mold=fashioned from the carbon of an old #6 dry cell. Propellent was a mixture of potassium chromate (purchased in pill form at local drug stores), sulfur and charcoal. It was stored in plastic capsules. The gun used cap pistol caps for the primer. The propellant was powerful but so sensitive that it was extremely dangerous. Once, while I was driving a ball home with a ramrod, one of my guns went off and the ramrod was imbedded in the ceiling. That sobered me, made me thoughtful, and turned my interests to other fields.

I built other things besides guns. These included electric arc furnaces, a propeller driven ice sled, several model submarines powered by rubber bands or water jets driven by compressed acetylene, model airplanes and gliders, radios of different kinds, a record player, a waterwheel generator, small steam turbines and steam engines, a small inboard motorboat, and an aerial "railroad" which rode on two copper wires stretched across our backyard and used a Lionel train motor and solenoid control.

My parents and friends assumed I'd be a physics professor or an engineer. What they weren't aware of was my growing sense of meaninglessness with science and engineering. No matter how fascinated I was with things mechanical, I found less and less meaning in thinking of myself as a physicist or engineer.

In college, therefore, I majored in philosophy and minored in English. To prove to myself that I wasn't chickening out of science and engineering because the courses were tough, I took a physics course my senior year, and did well.

An event occurred the summer of my first year in college which made me even more skeptical of science and engineering as a career. It was the bombing of Hiroshima. I heard about the bombing while listening to a crystal radio I'd made from some iron pyrites I'd found near my parents' summer home in Canada. I understood instantly that war would have to be ended or the human species would probably cease to exist.

Studying philosophy didn't help solve my feelings of meaninglessness much, but it did convince me that the most important issues had to do with values. Socrates' arguments about justice and virtue seemed irrefutable. At the same time, the draft--Selective Service--was pressing on me. I was a pacifist and was wrestling with whether I should do alternative service or become a non-cooperator. This personal involvement with the military system helped also to make me feel that war was the most important problem facing humankind. Further bolstering this view was the death of a friend of my brother, someone I had known and liked, too. He was killed in the Battle of the Bulge.

Through college, and for several years afterwards, I kept struggling with the problem of a vocation, unable to commit myself to anything. I worked for awhile in part-time projects run by the American Friends Service Committee. Finally, to earn a living, I started a small business in Chicago designing and manufacturing medical research equipment. Most of my work was with the Anesthesia Department of the University of Chicago, whose head then was an inventive Danish physician. He'd been active in the anti-Nazi underground in Denmark during the war. He wasn't a pacifist, but we got along together famously. Dr. Mörch had many unfulfilled dreams, and together we fashioned a number of new devices and machines. One was a non-electrical pressure-sensitive respirator for use in operating rooms where accidental electric sparks could ignite anesthetic gases. Another was a variable-volume respirator for polio and other cases who needed continuous assisted respiration. We also developed a special operating room table to carry anesthetic instruments and supplies.

Other projects were models of gas regulator valves for teaching purposes, special hypodermic needles, and tracheotomy tubes. Simple mechanical and electrical engineering, and very careful craftsmanship were involved in all the projects.

Also about this time, I patented a device for putting oil in automobile engines. It was never commercially successful.

After a year of the business, my problem with the draft was resolved by my being convicted for refusing to report for alternative service. I was sentenced to a year in jail. I served the sentence (three months off for "good time") at the Medical Center for Federal Prisoners, Springfield, Missouri. In prison, I read a great deal, one of the books being Terman's classic on radio engineering.

After being released, I worked in the business again for a year, then made the decision to give at least five years to the peace movement. It wasn't really a "decision," though. I could do nothing else. Engineering, no matter how connected with humanitarian goals, had lost all meaning for me. Psychologists would have a fertile field for speculations. In giving up engineering for humanitarian politics, I abandoned a field in which I had some talent but diminishing interest, for one in which virtually every element of my personality was unfitted, but which seemed more and more important.

My full time activity in the peace movement began in 1958, and has been uninterrupted. In the course of working with dozens of different groups, on almost every imaginable kind of project and activity, large and small, I've discovered that some of the more rudimentary engineering skills can be useful.

For instance, in 1960-61 I was on the San Francisco to Moscow Walk for Peace,[1] sponsored by the Committee for Nonviolent Action. We actually did walk about 4,000 miles across the United States, then another 1,200 miles across England, Western Europe, Poland, and western Russia. We carried signs that proclaimed our demands for unilateral disarmament and defense by nonviolent resistance, eventually in seven languages. How do you make a sign that is at once light, can be carried by people short or tall, is waterproof, and so strong that it can be tossed in the back of a truck or even stepped on by accident, without being ruined? Conventional demonstration signs made of cardboard stapled to a stick were almost worthless. On a windy day in Arizona, or on the Russian steppe, they might last 30 seconds.

We struck on making the background material from white vinyl plastic sewed onto an envelope to go on a frame. We cut the letters from colored vinyl contact material. Frames were more difficult to design. At first, we used ¼" plywood on pine handles that were pierced with one-

SAN FRANCISCO TO MOSCOW WALK TEAM AND SUPPORTERS AT A BRETHREN CHURCH IN NORTHERN OHIO. HARDWARE LEFT TO RIGHT: BUICK HEARSE CONVERTED TO A CARRYALL WITH SOUND SYSTEM ON TOP, WOODEN SIGNS, ELECTRICAL CONDUIT SIGNS, STREAMLINED LUGGAGE CARRIER ON PONTIAC STATION WAGON.

inch holes at six-inch intervals for grips. Later, we brazed frames from electrical conduit, with a central portion of wire mesh laced in place with nylon cord. These frames were so strong that they would survive being rolled over by cars. But they were too heavy.

An English furniture designer made elegant collapsible frames from aluminum tubing, epoxy glued at the joints, with adjustable walnut handles. One frame we fashioned from a piece of ¼" rod and a sapling trunk found beside a Russian highway. Perhaps the best and simplest design was corrugated aluminum roofing material cut to shape and nailed to 1x4 pine handles that were then drilled for grips, sanded and painted.

There were several long walks at this time in the peace movement, and all made use of supporting vehicles. They had to be at once old, and reliable. Vehicles couldn't be new because they had to be expendable. One Chevrolet carryall we used on a racially integrated peace walk through Georgia had a bag of eggs thrown through its windshield at 60 mph, all its side windows knocked out with a rake, and a 38 caliber bullet shot into a tire. On another project, a car was set on fire and destroyed.

We needed reliable cars to be able to quickly depart from situations where demonstrators might be mobbed. This meant engine rebuilding, and improving standard starter systems.

We also needed special vehicles to carry luggage and equipment. We designed a trailer to use as an office for the Quebec-to-Guantanamo Walk for Peace. Two hearses were converted into carryalls. We made a streamlined, water repellent, cartop-mounted luggage box that lasted for several years.

Another kind of project involved boats. In 1958, peace activists tried to sail the 38' ketch Golden Rule[2] into the Eniwietok bomb testing area. After the Golden Rule was stopped and taken into custody by the government, physical anthropologist Earle Reynolds succeeded in sailing his boat the Phoenix[3] into the area. In 1962, small boats Everyman I, II, and III[4] protested U.S. and Russian bomb testing. Everyman I was a plywood trimaran custom-built for the project. In 1964, as part of the Quebec-to-Guantanamo Walk project, and to protest the U.S.-Cuba travel ban, we tried to take the 20' motor launch Spirit of Freedom from Miami to Havana. In recent years, peace activist Scott Herrick has made several voyages to Cuba in his 48' ketch the Mondcivitano.[5] Maintaining and outfitting small boats for open-ocean voyages requires a variety of engineering skills.

With the growth of the anti-Vietnam War movement, a new field of engineering opened up. Public rallies and street demonstrations, large and small, required reliable and powerful public address systems. How do you design a sound system that will reach half a million people on the Washington Monument grounds? What kind of portable sound device is best for marshalling at demonstrations? What arrangement of sound equipment is best for fund-raising at rallies? What's the best equipment for New York City, where space for storing large horns is expensive, and traffic makes it difficult to use trucks and cars for transporting heavy amplifiers and other equipment?

Rallies also required special platforms and stages. Often, complex communications systems were needed for the larger events. The "logistics" of these projects held many engineering problems.

Perhaps the Mass March and Rally in Washington, Nov. 13-15, 1969,[6] posed the most challenges. Our main sound system was provided by Hanley Sound of Medford, Mass. It was a 5,000 watt high fidelity system mounted on 20' towers. Hanley also provided the stage, a collapsible unit formed from a semi-trailer, elevated by hydraulic lifts. Many elements of this system had been custom engineered, primarily for rock concerts. A great deal of improvisation was needed for its installation at every event to provide for variations such as terrain, crowd size, weather, power sources, and security against vandalism.

For marshalling, we used 24 "Amplivox" bullhorns, remarkable 50 watt units powered by 10 flashlight "D" cells.

The communication system involved citizens band (CB) and FM networks. The CB network had a 100 watt transmitter in the marshalling center, and about 20 mobile units. The FM network was provided by the police department, had a base at their headquarters, and about 12 mobile units. Naturally, we used it only for the least politically sensitive communications. Several electronic engineers and "hams" installed, operated, and maintained these systems.

A great deal of thought went into designing a money collection system for that demonstration. What kind of container would be best for gathering the money? How many would we need? These were complicated matters. Collecting money from half a million people isn't the same as passing a hat at a committee meeting.

We calculated that if there were 500,000 people, and we had ten minutes to collect money during a fund appeal, we'd need about 5,000 containers. It had to be easy to put the money in the containers, but difficult for the money to

fall out if the containers were jostled or dropped. Metal collection cans with slots in their tops could be purchased, but they were too expensive, the slots weren't large enough, and people could cut their fingers hurriedly inserting bills. We considered envelope boxes, shopping bags, and aprons with pockets, but finally decided on one-quart cardboard ice cream containers. They could be obtained in large numbers from Dixie Cup and other firms, and were inexpensive.

The next problem was the shape and size of the holes in their tops. These matters received a great deal of hard thought and were passionately debated. It was obvious that if the holes were too small, or the wrong shape, we might lose thousands of dollars. We experimented by having different people stuff bills through rectangular, square, and round holes of different sizes.

A round hole about 1¼ inches in diameter proved the best. But how do you cut round holes in 5,000 stiff cardboard covers? The owner of a machine shop devised a mechanical punch and die with which we punched most of the holes. A 1¼ inch leather punch used against an anvil of hardwood and struck with a hammer, also worked well.

We then had to secure the tops on the cannisters. Cement wouldn't work because the cardboard was wax impregnated. We finally used pressure sensitive duct or "gaffers" tape.

COLLECTION CANNISTER

Other problems were consolidating and transporting the contents of the thousands of cannisters. Tens of thousands of dollars worth of coins could weigh hundreds of pounds. Bills could be stolen. The entire collection might be highjacked. In the end, everything worked out safely and without loss, although there were many hairy moments. We collected more than $90,000, which enabled us to pay almost all the debts of the anti-war movement on the East and West coasts. The coins alone weighed about 1,000 pounds. It took us five days to count the money, and I learned what's meant by "filthy lucre." Large amounts of paper money stinks.

Another problem was providing toilets for all the people--sanitation engineering. We investigated renting toilets and found that it would cost us about $20,000. That was beyond our means, so we tried to convince the government that they should be responsible. Toward the end, it looked as if no one would be responsible. For a few hours one night people were using the Potomac. I purchased some plastic pails and garbage cans, and black plastic sheeting to improvise toilets. Then the government acted, and portable toilets appeared. In subsequent mass demonstrations in Washington the government has supplied toilets without question.

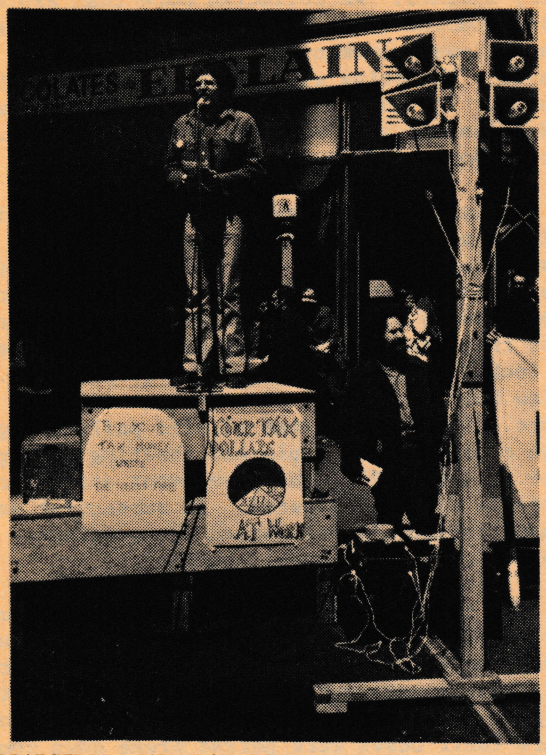
We never solved the bus parking problem. Our traffic engineering was woefully inadequate. More than 4,000 buses came into the city, dropped off their passengers, then went to different parking areas. Our system for informing people where their buses were parked broke down completely. Some people wandered around in the cold for six or seven hours after the rally before they found their buses--but few complained. To this day, no one has come up with a workable plan for parking then finding large numbers of buses in Washington.

The engineering problems posed by the anti-war movement actually created specialties. One man has specialized in CB communications networks and equipment.[7] I specialize in small and medium sized, portable sound systems[8] and stages. The sound systems and stages are modular in design. The stages are built up from 4x4x2, and 4x8x2 collapsible sections that can be stored compactly. The amplifiers are bullhorn amplifiers ganged in series or parallel. There is a collapsible 15' tower for horns, and a platform that will go on the top of a car. All the equipment can be carried in or on top of a sedan. Some can be transported on subways. The dry cell power supplies make the system independent of power outlets, and safe to use in rainstorms.

For the mass demonstration at the ITT headquarters in NYC about two years ago, I designed a portable system for broadcasting "air war" sounds that used a tape recorder, a 50 watt am-

plifier, and a horn mounted in a large canvas suitcase. An external switch activated the unit.

It's always seemed to me that humanitarian political rallies deserve the best and most reliable sound systems that can be designed. The people should hear.



COLLAPSIBLE, MODULAR SOUND SYSTEM AND PLATFORM

Photography is also important to the movement, and I've been drawn to both 35mm still and Super 8 motion picture formats. Demonstrations pose special problems for photographers. They can have a great deal of action, and often are dangerous. What are the best kinds of cameras for them? Experience has shown that ½ frame, 35mm cameras with built-in light meters probably can produce the best results.[9] They are compact, can take 72 pictures without being reloaded, and are inexpensive, so you don't lose much if they're damaged or confiscated. And, you must have your own darkroom. It's the only way to meet newspaper deadlines.

Super 8 can be almost as sharp and clear as 16mm, but the cost of the film is about ¼ as much. Color film is customarily used, but tri-x b&w is available, too. All film is sold in cassettes that make camera loading easy and quick. Cameras are light, compact, and available in a multitude of styles and costs, all of which produce good results. A great variety of projectors, all powerful and compact, are available, too. Super 8 equipment costs only a fraction of the cost of 16mm equipment. While most Super 8 shooting is silent, reliable sound equipment is available, and is constantly being improved and made less costly.

Security systems are yet another field of movement engineering. I was associated with New England CNVA, Voluntown, Ct., when it came under attack from Minutemen and other right-wing groups. Gangs of thugs invaded our farm, broke windows, and beat up some of us. An arsonist burned down our barn, almost the main house as well. State troopers engaged Minutemen in a gun battle on the premises. Over several years, we kept almost constant watch at night. An electronics engineer developed a device that sounded an alarm if a person on watch failed to signal at a prescribed interval with a walkie-talkie. A physicist developed electric-eye detection devices. Several fire alarms and buzzer signal systems were designed and installed.

These are just some of the ways in which engineering skills have been needed by the movement. Granted, while many of the problems have been intriguing, few have been "sophisticated." Few of the devices developed have much commercial value. But when the problems were there, and the equipment was created, it seemed related to the most important work in the world.

Knowledge about fundamental principles of physics, electronics, and chemistry, combined with fine craftsmanship and improvisation, are the engineering skills needed for most movement activities. General engineering knowledge, apart from skills, can also be valuable.

As the movements have become more conscious of the role that technology and massive industrial corporations play in the arms race and imperialistic U.S. policies, weapons systems analyses have become more and more important. The "air war," the "automated battlefield," the B-1 bomber, Polaris and Trident submarines, MIRV's--engineers can help describe and interpret these systems. Recently, environmental pollution, particularly the threat of radioactive pollution from nuclear power stations, has been recognized as a major danger to everyone. Engineering knowledge in all these fields doubtless will become even more important to the movements in the future.[10]

Another way that engineers can relate to the movement is to design devices that can help oppressed peoples. Komitee Wetenschap en Tehnick voor Vietnam, Laos en Cambodia,[11] a Dutch group, is oriented toward practical engineering and develops devices that can be of use in Indochina. Several already in use are: a surgery lamp, a blood pressure meter, a water sterilizer, an electrocardiophone, and disinfectant for small surgical instruments.

Back in 1952, when I first became active in the peace movement, SSRS, the Society for Social Responsibility in Science, was the only group devoted to the social and political implications of science and engineering. SSRS was formed mainly of physicists and others who were deeply disturbed by nuclear weapons. Today there is CSRE, with its publication SPARK, and SESPA, Science for the People, with its own bi-monthly publication, various books and pamphlets, and a national network of chapters. The movement for engineering and scientific responsibility even has a complicated politics--which must be a sign of its maturity. This is encouraging growth.

Throughout these years in the movement my engineering skills have been used so often that I've gained the reputation of being "the expert" in "logistics" for mass demonstrations. Six years ago there were only one or two of us who had a comprehensive grasp of the engineering problems of demonstrations; today there are probably half a dozen or more people with a high level of competence. This is good, but we need others. Every movement activity should be able to benefit in its practical organization from the best engineering knowledge and experience available.

I try to keep up with scientific and engineering developments. I read the Scientific American faithfully. It gives me at least a sense of what's going on in the scientific and engineering world. Also some of its articles are directly relevant to humanitarian politics. In 1972, there was a fine article on the cratering of Indochina.[12] Recent issues have discussed technical aspects of Trident submarines,[13] submarine detection,[14] surveillance satellites,[15] pollution, nuclear reactors, energy, and other politically pregnant issues. The factual approach of the Scientific American I find a welcome change after the subjective rhetoric of much political writing.

In working in the movements I've found many opportunities for using engineering knowledge and skills. It's good to be able still to think of myself at least partly as an engineer, and to enjoy the fellowship of CSRE and SPARK.

References

1. There are two books and a film about the Walk. You Come With Naked Hands, by Bradford Lyttle, and We Walked to Moscow, by Jerry Lehman, are available in the Swarthmore College, Pace, and many other college and university libraries. The 25-minute film can be rented from CNVA, RFD 1, Box 430, Voluntown, Conn. 06384.

2. See The Voyage of the Golden Rule, Albert Bigelow, New York, Doubleday, 1959, 286 pp., $3.95. Available from the FOR, Box 271, Nyack, N.Y.

3. The Forbidden Voyage, Earle Reynolds, New York, D. McKay Co., 1961, 281 p., $4.95.

4. Voyage of the Phoenix, 54 min., color. Available from Friends Peace Committee, 1515 Cherry, Phila., Pa. 19102.
Everyman, 30 min., b&w. Available from CNVA, RFD 1, Box 430, Voluntown, Conn. 06384.

5. For reports and slide sets about these trips write to Scott Herrick, c/o Bowman, 1260 S.W. 29th Terrace, Ft. Lauderdale, Fla.

6. A booklet about the "logistics" of this event is available: Washington Action Nov. 13-15, 1969, a report and comments from the viewpoint of a practical organizer; Bradford Lyttle, 339 Lafayette St., New York 10012, 1969, 57pp., $1.00.

7. Write me for his name and address (see above).

8. Reprints of "Audio Power to the People," an article by me, published in the Sept. 1, 1972, issue of WIN, that discusses PA systems for movement events and describes some of my equipment in greater detail, are available from me at 339 Lafayette St., New York 10012.

9. Reprint of WIN article by me, discusses at length the use of ½ frame 35 mm cameras. Write to me at 339 Lafayette St., New York 10012.

10. Two of the better known groups that use engineering analyses are: National Action/Research on the Military-Industrial Complex (NARMIC), 160 N. 15th St., Phila, Pa. 19102, and Ralph Nader's organization, 133 C St., SE, Washington, D.C.

11. Komitee Wetenschop en Technick vor Vietnam, Laos en Cambodja, Prinsegracht 834, Amsterdam, Holland; Tel. 22 84 61.

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13. "Missile Submarines and National Security," Sci. Amer., June 1972, p. 15.

14. "Antisubmarine Warfare and National Security," Sci. Amer., July 1972, p. 14.

15. "Reconnaissance and Arms Control," Sci. Amer., Feb. 1973, p. 14.

16. "The Prospects of Fusion Power," Sci. Amer., Feb. 1971, p. 50.

17. "Energy and Power," Sci. Amer., Sept. 1971.

STOP the B-1 Bomber--START Peace Conversion

by Peter Barrer

"The fact is that among intelligent defense experts, the B-1 is a joke. It is a public works project for the aero-space industry rather than a needed weapon for the defense of the U.S. The irony of it is that if we really do need to spend additional funds for public works projects, the expenditure of the same amount of money in dozens of different ways, would produce more jobs for the money spent and also bring much greater benefits to the country."

Senator William Proxmire, Congressional Record, 12/11/71, pg. S 21437

To most Americans "B-1" means a vitamin. But to the Air Force and three large corporations, Rockwell International, General Electric, and Boeing, B-1 is the name of a proposed new bomber to succeed the B-52 and FB-111 for strategic war and for future conventional wars. Two billion dollars has been spent so far for research and development. Estimates of the total cost range from $43 billion (the Air Force figure) to $75 billion (the figure projected by a Princeton University study).

There is a growing controversy over whether the B-1 is a useful and economical weapons system in the military's terms. The debate centers on its usefulness as a nuclear deterrent. On one side are the Air Force and its supporters. On the other are such critics as 110 Members of Congress for Peace Through Law, the Center for Defense Information, and the Project on Budget Priorities. Already there are several publications which fully document the case against building the B-1.[1]

B-1 BOMBER IN FUTURE VIETNAMS

At times supporters of the B-1 bomber argue that its real importance is not for strategic deterrence, but for use in conventional wars like Vietnam. During the Christmas bombing of North Vietnam, Air Force spokesmen argued that the B-1 would be much more effective than the B-52 for similar use in the future. While this argument itself is open to debate since air defenses also are being improved, the more fundamental point is that most Americans don't want more wars like Vietnam.

Since World War II, U.S. military interventions have been in developing countries: Korea, Guatemala, Lebanon, the Congo, Cuba, Vietnam, Laos, the Dominican Republic, Cambodia. Today, a major source of conflict in the world is the struggle by developing countries to gain more equitable distribution of political and economic power. As a part of this struggle, multinational corporations are coming under increasing criticism. The interests of U.S. multinational corporations in developing countries influence U.S. foreign policy in ways which could lead to military intervention. It is no coincidence that many of these same corporations are strong supporters of the B-1 bomber, which may eventually be used to protect "U.S. interests" in a future Vietnam.

CORPORATE POWER AND THE B-1

The two groups pushing hardest for development and production of the B-1 bomber--the Air Force and major corporations with B-1 contracts--also have the most to gain in profit and power if the B-1 eventually is built.

Rockwell International, General Electric, and Boeing Corporation already have major contracts to build prototypes of the B-1 bomber. Rockwell has a $1.37 billion contract to build the airframes; GE has a $458 million contract to build the jet engines; and Boeing has a $774 million contract to provide the avionics equipment, the electronic "eye and brains" of the bomber. If a final decision is made to produce the 241 B-1 bombers requested by the Department of Defense, these three corporations will gain billions of dollars in contracts. It is estimated that 3,300 other corporations will benefit as suppliers for the program.

Weapons contracts are extremely profitable business. In 1971, the General Accounting Office reported in their initial draft that the average pre-tax profit rate on weapons contracts was 56% on investment in defense sales. (GAO more accurately uses the term "equity capital allocation.") However, Pentagon and military contractors succeeded in having the report revised so that 21.1% was listed as the average profit rate. In many cases, profits are guaranteed by the Pentagon.

The over-reliance of Boeing and Lockheed on military contracts is a matter of public record. General Electric, which ranks second among the largest 100 military contractors, does 12% of its business with the military, and Rockwell does 25%. Shortly after Rockwell was granted the development contract for the B-1 airframes, its chairman, Willard Rockwell, Jr., was quoted as saying, "We knew that as a business we had just one more chance--the B-1." What may be "good" business, however, may not be necessary for national defense.

The U.S. Air Force also has a large stake in development of the B-1. According to the Secretary of the Air Force, the B-1 is the highest priority project for the Air Force in the 1970's. The Air Force has been pushing for a new strategic bomber for several years. After defeat of the B-70 bomber, the Air Force supported development of the commercial Supersonic Transport (SST), as the best way to keep alive the possibility of a supersonic bomber. Many experts have argued that in the missile age the manned bomber is obsolete for strategic warfare. But the Air Force, in part motivated to keep its "share" of the military budget and maintain its power and prestige in relationship to the other branches of the military, continues to wage an aggressive campaign for a new strategic bomber.

These two powerful pressure groups for the B-1 bomber, the Air Force and major corporate contractors, work hand-in-hand lobbying with Congress, almost as if they are the central office and subdivisions of one large corporation. There is, in fact, considerable overlap and interchange of personnel between the corporations and the Pentagon.

PEACE CONVERSION AND THE B-1 BOMBER

Most Americans favor cuts in military spending. The 1.3 trillion dollars we have spent on the military since 1946 has not made us feel more secure at home or abroad. Rather it has transformed our economic system into a planned military-warfare economy with frightening concentrations of power in the Pentagon, White House, and multinational corporations, institutionalizing the capacity for future Vietnams.

What America needs is Peace Conversion, which could:

- redirect tax funds to meet real human needs
- determine production based on those needs rather than on profit or growth
- achieve a steady-state economy instead of increasing the GNP
- create new jobs for millions of defense workers
- end war profiteers' huge profits and power
- change the lines of power so that the people most affected share in making economic and political decisions

- develop ways of defending human values without violence
- support human liberation abroad by suspending aid to dictatorships and privileges to the multinational corporations.

As the above enumeration indicates, peace conversion includes many of the ingredients for a better society and a more peaceful world. How to make peace conversion into a vital national objective when we lack planning for a peace economy and have developed such strong central planning for a war economy is an enormously challenging problem.

Economic conversion, although not peace conversion, has been presented to Congress since 1963, but so far Congress has not passed even a minor conversion bill. In 1969 the United Auto Workers proposed a plan to Congress for conversion, titled "Swords into Plowshares." Hopefully, through pressure from its constituents, Congress will assume the authority vested in it to bring about peace conversion, but even then, additional power mechanisms for instituting social change are necessary.

Since the military-industrial complex opposes conversion proposals, millions of American workers are held hostage to arms production. Planning for peace conversion will require an unprecedented national educational and political movement which demonstrates the real possible alternatives for full employment without massive, unnecessary military spending.

REFERENCES

1. A report by Members of Congress for Peace Through Law was introduced into the May 5, 1971, Congressional Record by Rep. Seiberling.

The Center for Defense Information report: "The Strategic Bomber: Here to Stay" is available from the Center at 201 Massachusetts Ave., N.W., Washington, D.C. 20002; an abridged version is available from the American Friends Service Committee, 112 S. 16th St., Philadelphia, Pa.

Also available from the American Friends Service Committee, at a cost of $1, is a poster and a package of readings about the B-1 and peace conversion.

The Honeywell Campaign

by Mollie Babize

In trying to get a hand on the tyranny of multinationals, Honeywell is not the corporation that first comes to mind. General Electric, Gulf Oil, certainly ITT are corporations which epitomize the malevolent power of a few people over many. Honeywell, on the other hand, seems to be the liberal: good hiring policies, employee benefits, socially-oriented projects, and (as with the others) a generous advertising budget promoting this corporate image.[1] Yet in the face of this liberal facade, it is the manufacturer of the most hideous weaponry used in Indochina[2,3] ... and elsewhere.

It was precisely because of the anti-personnel weapons created and marketed by Honeywell that Clergy & Laity Concerned decided, early in 1972, to focus their anti-war efforts on this corporation. Building on the previous work done by the Honeywell Project and its off-shoot, the Council for Corporate Review, CALC mobilized some 20-odd local chapters into a multi-faceted campaign geared towards computer users, camera stores and photography buffs, architects, medical schools and universities -- raising consciousness and encouraging them to find alternatives to Honeywell computers, cameras, thermostats, medical equipment and job possibilities. And to advise Honeywell of their protest to what one engineer terms its "atrocity engineering." In one case, an entire city council (Ann Arbor) voted to enact a city-wide boycott of Honeywell products. On the surface, it was an economic pressure, but the real blow was to that abstract but coveted component of capital assets: the corporate image.

In the Boston area, it was the employees of Honeywell who became the primary constituency. A direct action group loosely formed in the Fall of 1971 (called the Daily Death Toll, or DDT, group) had also made that pilgrimage from anti-military to corporate focus, and eagerly seized on the Honeywell Campaign as a way to dramatize their concern. Initially the approach was confrontational with a "die-in" in the lobby of one Honeywell plant where research was being done on infrared sensors. But almost immediately the tactics made a subtle switch, and the leaflets became more conversational in tone, inviting Honeywell employees to lemonade and chat on the shady lawns surrounding each plant. Encouraged by the response of workers (who shared word on similar efforts happening within Honeywell) as well as of management (who were anxious to get us off Honeywell turf lest "union organizers" follow suit) the DDT group stepped up their leafletting, building for a "vote" at the headquarters of the Information Systems Division in Waltham, Mass.

It was a sunny August day in 1972, the war in Indochina still acknowledged a war, and reception to our poll was good. Of the 600 ballots handed out, 235 were returned, of which 135 felt that Honeywell should immediately halt the research development and production of anti-personnel weaponry. Eighty-eight felt Honeywell should continue; the rest were ambiguous. Nearly all expressed, in scribbled or neatly typed comments, the anxiety of working for a corporation one part of which was involved in ambiguous, if not down right immoral, work. The anxiety was compounded by a lack of options.

There were those who had tried speaking out. One attempted a showing of NARMIC's slide show on the "Automated Battlefield" (a well-documented anti-war presentation which comes down quite hard on Honeywell) but cancelled it at the last minute for fear of losing his job. Another -- previously a winner of Honeywell's top technical award -- had taken the proxies of 17 fellow employees to a shareholders meeting, speaking out (against management) in support of economic conversion.[4] He returned all the more frustrated with the management's disinterest in his concerns. Twice, a group of women and men tried to initiate an employee newsletter -- an alternative to the predictable house organ. And twice, following threats (and in one case, the reality) of being

Honeywell, the largest producer of anti-personnel weapons in the US, produces the BLU-26/B, or guava bomblet, shown on the left, which consists of a hollow, soft metal spherical casing, about 3" in diameter, containing from 300 to 600 steel pellets. Hundreds of these bomblets are packed into a dispensing unit the size of a 750 pound bomb.

The pellets cannot penetrate cement, sandbags, earthen cover or military structures. They are only effective against people in the open.

"recycled", the paper folded.

Alienation within the corporate structure led individuals to attempt these innovative actions; yet it was also alienation -- a lack of support structures among fellow employees -- that led to their frustration. There is no way, within the Massachusetts Honeywell plants, for employees to share their opinions. The official Honeywell papers (Honeywell World and the local Output) are heavily censored, and the management-instituted feed-back system ("rap-up") responds selectively if at all. With each employee working in her/his own cubicle, and with no union or committee to participate in, the workers in Honeywell are often as distant from each other as they are from corporate executives. In fact, it was often clearer to those outside the extent to which Honeywell workers shared a concern about the production of anti-personnel weaponry, or the ramifications of Honeywell's "World Wide Military Command and Control System," or the use of their infra-red sensors in an electronic battlefield.

The comments included on the vote taken in Waltham expressed this clearly, and the resulting leaflet distributed by DDT (which included a good number of these comments)was perhaps the first time Honeywell employees heard each other speak out. All of which led to another idea: perhaps this was the best way to initiate the alternative "voice" of Honeywell, by encouraging this feedback on a more sustained basis.

Luncheon gatherings soon moved from Honeywell lawns to neighboring churches, enabling more people to raise fundamental questions about their corporation and its policies. And another thought took shape: why not establish a place where, over a period of months or years, people could gather to discuss possible options to an alienating system? -- a place that workers from Honeywell and other firms could share their frustrations and develop alternatives. -- and a place where some of those people involved in the DDT group could establish a non-exploitative, non-hierarchical means of supporting themselves. It was seen as the corporate equivalent of the GI coffee house and book store: home cooked lunches, with an available reading area, open at night with seminars or films. Above all, it was to be used as employees within these firms saw fit: the direction was up to them.

Common Stock, as the restaurant called itself, has gained the support of a variety of people. Anti-war activists see it as a fresh approach to a tired struggle. Corporate allies are excited with the possibility of a tasty alternative to cafeteria food, and a common meeting ground. To the thirteen people who form the basic collective, it appeals as the only visible option to working "within the system." It is an idea that sustains itself in the face of monumentally frustrating failures to secure a location and actually get started.

This year is one of lessened activity for the Honeywell Campaign, as it is for many movement groups. Leafletting continues around Boston once a month, there is an occasional demonstration as a Honeywell recruiter comes to campus, but primarily the efforts are directed toward collecting data, up-dating files, tracking down new contracts, and trying to figure out what the future of corporate campaigns should be. There will be the usual presence at Honeywell's annual shareholders meeting in May, whether or not the resolutions submitted by the project appear on the proxy ballot. As 117 nations gather in Geneva to update conventions governing "humanitarian warfare," the issue of anti-personnel weaponry will be discussed.

The real dilemma, with a nearly invisible war going on in Vietnam, is the political grounding of the campaign in the face of personal, organizational, and experiential changes. In the past, it was easier to sustain both the more particular concern of anti-personnel weaponry and a growing perception and understanding of corporate power and control. While the war itself continues to consume certain energies, a stronger emphasis on the inter-relation between community control and reconversion intrigues many. People seem to be clearer on the role of corporations -- even "liberal" ones -- in American imperialism, but still uncertain or ambivalent about the approach to the problem. The response to that dilemma, more than anything else, will determine the future of the Honeywell Campaign.

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4. Honeywell: An Inside View, by William Kohlbrenner. A former engineering employee recounts his experiences prior to and including his resignation. Reprinted from five consecutive issues of American Report, Jan.-Mar. 1973. 15¢

All the above are available from Boston Area CALC, 474 Centre St., Newton, Mass. 02158.

Energy Waste in Structural Design

by Don Osias

Residential and commercial space heating requirements consume about 18% of the nation's total energy use. Water heating, air conditioning and lighting account respectively for about 4%, 2.7% and 1.7%. The heating, ventilation and air conditioning (HVAC) functions of residential and commercial structures are therefore responsible for approximately 1/4 of the national energy consumption.

The construction industry, however, has frequently ignored considerations of energy use when designing buildings. The design of typical energy systems for buildings has not been consistently responsive to any single criteria including cost. The aesthetics which dictated the construction of large glass walled buildings has had far more effect on the design of buildings than has the application of rational design principles to performance goals such as comfort or accessibility.

Among the most important determinants of design are empirically determined "typical" building techniques, compliance with specific building codes and government standards, marketability, ease of construction, and minimization of perceived first costs.

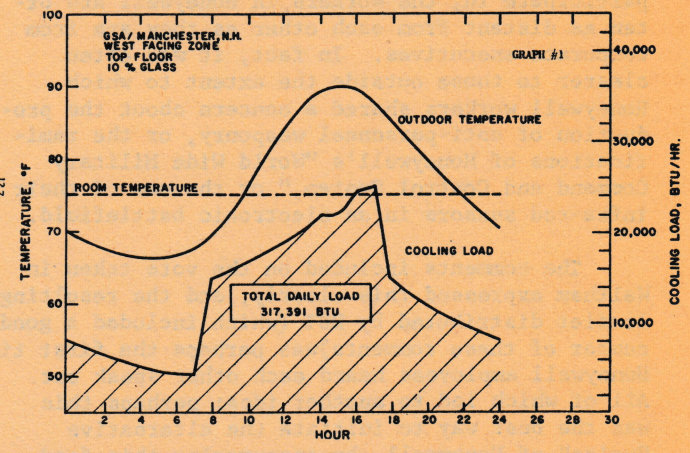
Technically feasible options exist which are capable of greatly reducing the energy use of buildings. Besides saving large quantities of fuel, many of these systems are economically desirable from the point of view both of first cost and of operational expense when properly included in designs. Others would pay for themselves many times over during the life of the building but require larger initial investments.

The environments designed by architects for Americans' homes and offices vary widely as does the efficiency with which the facilities designed to produce that environment provide us with light heat and cooling. The levels of illumination provided throughout many modern buildings may be excessive and their need unclear, commonly specified comfort levels have little empirical basis and may be disadvantageously restrictive, presently accepted insulation levels are of dubious value and arbitrary origin, the amount of window space needed and the type of glass to be used are rarely considered carefully.

A recent University of Missouri study found that the energy requirements of several buildings of similar size, function, and occupancy differed by 123%. A designer faced with inadequate data for the specification of HVAC equipment is likely to specify an oversized plant in order to avoid the rather serious consequences of installing one of inadequate capacity. Frequently however, as this study suggests, the specified units may be far too large and operate inefficiently at 10% - 40% of capacity most of the time. (1)

In order to eliminate such architectural design variation it is necessary to deal quantitatively with those conflicting trends which contribute to the design. Computer simulations, though just as subject to errors from inadequate date or improper analysis as hand calculations, allow examination of a much larger number of possible designs and the simultaneous variation of many parameters.

National Bureau of Standards (NBS) researchers interested in the possibilities of computer design, have run a simulation of the cooling plant requirements of a federal office building under construction in Manchester, N.H. Using conventional design practice based on a constant (24 hour) indoor temperature of 75 F and a typical outdoor summer temperature variation, they calculated a total daily



load of 317,391 BTU with a peak demand of 25,000 BTU/hr. In later calculations they restricted the peak plant capacity to 18,000 BTU/hr and flushed the building with cool outdoor air six times/hr during the evening. For the plant operation indicated (graph #2) the indoor temperature slowly rose from 75°F at 8:00 a.m. to approximately 80°F at 5:00 p.m., the total load was reduced by 32% and the peak load of 18,000 BTU/hr is 28% less than that of the first analysis.

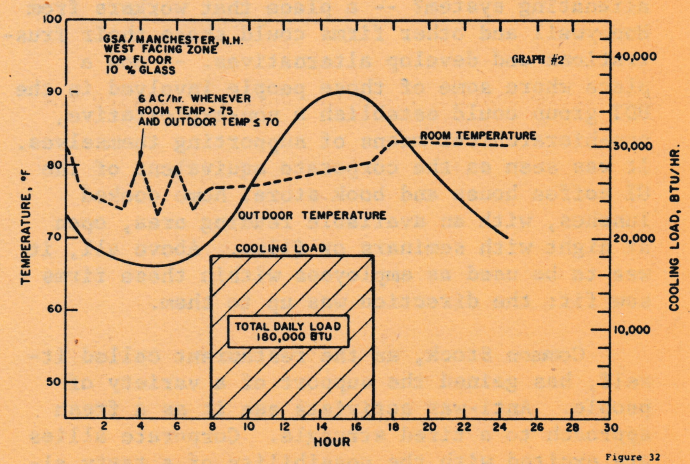


Figure 32

These simulations clearly show the benefit of specific case design over conventional rule of thumb techniques. An 18,000 BTU/hr/zone installation represents a considerable investment savings over a 25,000-30,000 BTU/hr/zone unit. These simulations assumed constant building parameters, a constant cooling system efficiency and a standard summer de-

sign temperature. (2)

As the actual daily temperature will usually be less than the design temperature, it may be desirable to "piggyback" more than one unit designed to meet the building requirements by operating at full rated load in various combinations. (3) The use of small modular units run at full load as frequently as possible is most efficient if flexible comfort conditions are allowed. Recent studies have found the "mean comfort temperature" to have wider range and to vary much more slowly with respect to relative humidity than the conventional ASHRAE Effective Temperature charts indicate. (4)

Simple arithmetic suffices to show that for certain one family homes, investment for additional insulation may be offset by savings from a reduction in the capacity of heating, cooling and distribution equipment. The returns accruing to the owner during the life of the home from reduced operating costs will be considerable in any case. The estimated fuel use reductions attainable from adoption of the "economic optimum" insulation levels, as determined from life-cost considerations, could be 40%-50% of present consumption. (2, 5, 6) The added initial expense of double glass or storm windows is similarly justifiable in many climates by significant fuel savings although poor instalation or other variables may reduce the benefits below those expected. (6, 7)

The ubiquitous metal and glass high rise buildings that dominate many cities' sky lines are generally of single glazed curtain wall construction containing no insulation. Most new commercial buildings are designed with at least 50% of exposed wall area composed of fixed glass. The thermal losses and the solar heat gains through a single pane of glass are extreme. The heat loss through a single pane of ¼" glass is more than ten times that of an even moderately insulated wall.

The art of shading windows with louvers, overhangs, balconies or otherwise has been abandoned and few architects consider prevailing winds or insolation when planning building orientation or window location. The four sides of a building have significantly different solar heat gains. In a climate with considerable cooling loads the building service facilities could occupy the southern wall which should then have a small percentage of glass minimizing solar heat gain to the structure and could, perhaps, incorporate a solar collection and thermal energy storage (TES) system for absorption cooling and heating.

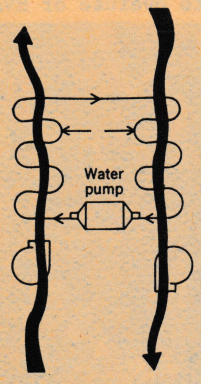
Glass walled buildings have not been restricted to the commercial sector. An effort to stimulate the construction of glass walled homes and garden apartments appears in advertisements such as those for "total-glass walls" in apartments and "sixteen foot glass end walls" to be built with insulating glass for colder climates "to keep the weather out and the heat in." Even double layer insulating glass, however, conducts five times as much heat as wall space. One bright spot is the advs. for wood frame, tightly stripped, double hung standard size home windows. The wood frames conduct half as much heat as aluminum frames -- a significant fraction of window losses -- and they are not apprciably wind chilled. (2)

The fixed windows of many high rise buildings make the occupants dependent on forced air ventilation to the point of commonly requiring "evacuation" in the case of a failure. A New York architect has estimated that during about 600 of the 3,000 some hours of cooling season in New York, it is cool enough to require no air conditioning and that installation of pivotable sash could result in a 15%-20% reduction of annual cooling and ventilation load. Inadequate controls also add to overuse of HVAC systems. Many central air conditioning systems cool entire buildings in response to a few controls in the warmest sections of the building and then regulate room temperature elsewhere with electric heat. Similarly, most humidity control systems utilize "new" electric reheat for the temperature control necessitated by use of the cooling plant to reduce humidity. Keeping the coolant coils chilled to condense water vapor causes over-cooling. Air conditioners do obey the second law of thermodynamics, however, and reuse of the waste heat circulated through the condenser coils would more than fulfill any reheat requirements. The use of electric reheat is particularly ridiculous in large buildings for which the plant size required and the expected operating savings would justify the use of heat pump heat recovery systems as well. Heat pumps can be used to perform many functions including the transfer of heat from one section of the building to another to correct cooling imbalance, recovery or removal of heat produced by lighting, and exhaust air heat transfer. (8)

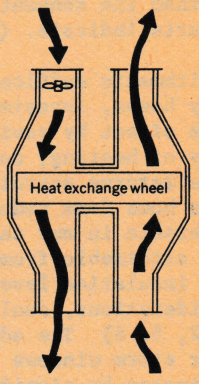
Lighting generates 25%-60% of the cooling load of most office buildings and inadequate controls frequently make it impossible to benefit from natural lighting or to adjust to building use patterns. It is not uncommon for entire floors to utilize a single pair of switches. One late night office worker or night shift porter can keep an entire floor of

one of N.Y.'s skyscrapers fully lighted. Ventilated or cooled fixtures can reduce interior heat gain from lighting by 30%-80%. Reducing power used for lighting by one watt allows an additional ¼-½ watt reduction in cooling requirements. Such a reduction may be achieved by use of auxilliary lamps with lower background levels and/or by converting to more efficient luminaires and fixtures. Flourescent bulbs produce 3-5 times the amount of light per watt as incandescent bulbs. Heating season benefits are also realizable from the elimination of unnecessary light as a boiler uses about half the amount of fuel to produce a kwhr of heat as is needed to generate one kwhr of electric power which a light bulb reduces to heat. NBS researchers conservatively estimate that lighting properly designed for expected activities with adequate controls could "without altering lifestyles or increasing costs (reduce the) energy required to light new buildings ...by 25%." (2)

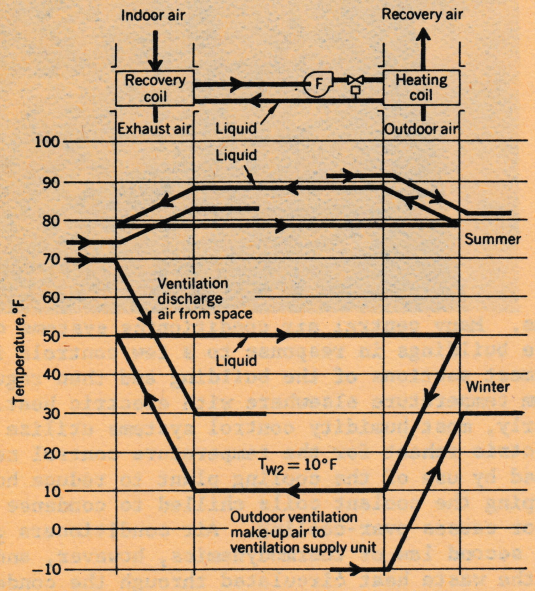
Ventilation air typically accounts for 15%-30% of the heating and air conditioning loads. The hot air pumped out during the winter and the cool air exhausted during the summer represent substantial energy losses. A reduction of 50%-70% in such losses is readily attainable by the use of simple commercial heat exchangers. A French lab has developed an inexpensive conductive wall system utilizing replace-

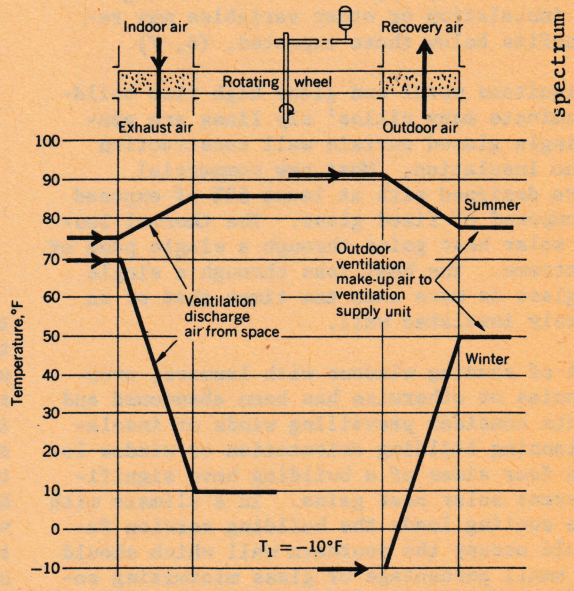


[5] A "runaround" cycle can increase the temperature of outdoor air for ventilation by as much as 40 degrees (+10°F to +50°F) in winter. In summer, however, the temperature will be lowered by only about 10 degrees. The runaround cycle circulates a liquid by means of a water pump (top) through heat-exchange coils in the supply (and return) air systems to warm ventilation from the outdoors in winter and cool it slightly in summer.



[6] The thermal, or "heat-exchange" wheel can increase the temperature of outdoor makeup ventilation air by up to 60 degrees (F) in winter; in summer, it can reduce the temperature by 10-15 degrees. The sketch at top shows the thermal wheel which employs dry heat-exchange surfaces.





spectrum

able plastic membranes which has attained efficiencies of 70%-80%. (9) Heat exchangers can also be used to reduce stack losses. Inexpensive units mounted in residential furnace and boiler flues could increase the net combustion efficiency by 8%-15%.

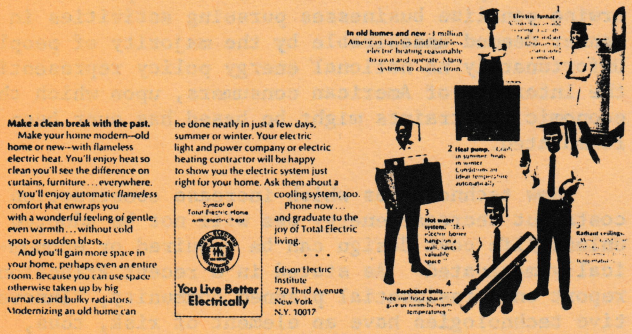
Numerous solar energy collection systems have been designed for both space and water heating. Commercial solar hot water heaters have been in use in Florida and in a number of foreign countries for many years. Experimental space heating units have been in operation for thirty years. Allowing for current collection efficiencies, the radiant energy incident upon a typical one family home is several times the total energy consumed annually within the home. In fact, for a 125,000 square foot eight story office building in the N. Y. area the collectable solar flux incident upon the roof would supply, by various estimates, 40%-200% of the annual space and water heating load. Absorber materials from anodized black aluminum to flat black spray painted concrete have been suggested and commercially available glasses and plastics have been used as insulation for the panels. TES systems utilizing change of phase latent heat storage, liquid salts, hot water storage and even hot bricks or stones have been used.

Solar energy heating systems represent a trade off between initial investment and operating expenditure reductions. It has been estimated that an economic solar heating system for the northeast would provide 40%-50% of annual heat needs. To provide more would necessitate inconveniently large heat storage capability. Consequently, the first cost of a conventional backup system could not be reduced significantly. Nevertheless, solar space heating consid-

ered on a life-cost-to-owner basis is presently competitive with electric heat in most parts of the U.S.; may now be competitive with oil heat; and if mass production techniques were used to decrease the costs of TES and collection materials would be competitive with gas heat when the price of gas doubles. (10, 11)

The total electric house has been advertised widely by both utilities and manufacturers. During the past few decades the utilities have spent an average of less than ¼% of gross income on research (ex. to improve generation or effluent control techniques) as opposed to a U.S. industry average of 2.5%. During the same period the utilities have spent an average of 2% of gross income on advertising. (12, 13) The total thermal efficiency (which includes the generation and transmission losses associated with the power plant) of resistive electric

When curtains stay clean as a wedding gown...you've graduated to flameless electric heat



Make a clean break with the past.
Make your home modern—old home or new—with flameless electric heat. You'll enjoy heat so clean you'll see the difference on curtains, furniture . . . everywhere.
You'll enjoy automatic flameless comfort that enwraps you with a wonderful feeling of gentle, even warmth . . . without cold spots or sudden blasts.
And you'll gain more space in your home, perhaps even an entire room. Because you can use space otherwise taken up by big furnaces and bulky radiators. Modernizing an old home can be done neatly in just a few days, summer or winter. Your electric light and power company or electric heating contractor will be happy to show you the electric system just right for your home. Ask them about a cooling system, too.
Phone now . . . and graduate to the joy of Total Electric living.
. . .
Edison Electric Institute
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New York
N.Y. 10017

Symbol of Total Electric Home with electric heat

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In old homes and new—1 million American families find flameless electric heating reasonable to own and operate. Many systems to choose from.

1 Electric furnace.

2 Heat pump.

3 Hot water system.

4 Baseboard units.

5 Radiant ceilings.

heating is less than half that of typical gas or oil furnaces. A total electric home with major appliances will consume nearly twice as much fuel as an identical home with gas or oil central heat, gas range and gas dryer. The waste heat released to the environment from the use of electric heat is actually about seven times that wasted by a fossil unit. A fossil fuel furnace with a 75% efficiency wastes 1/3 BTU of fuel in delivering 1 BTU of useful heat whereas a power plant with a typical efficiency of 30% releases 2-1/3 BTU of waste heat in providing the same amount of heat to the home.

The utilities have until very recently offered incentives of various sorts to builders to install electric heat and appliances. As of 1971, the Potomac Valley Power Co. had managed to quadruple the percentage of customer units owning electric water heaters, as compared to its competitors, by offering builder incentives. (12, 14) In early 1972 there were over 5,000 apartments under construction by NYC and the Urban Development Corp. (UDC) for which Con Edison had agreed to pay $150/unit "promotional bonus" in return for the installation of electric heat. In early 1974 the New York Times noted that at least an additional 2,000 apartments with electric heat were planned by the UDC. The argument was put forward that electric heat was installed at a savings of about $1,000/unit in order to keep rents down. The costs to a tenant of providing electricity for heat will exceed the costs of an oil system. Over the life of the building, the difference in costs would be more than sufficient to pay back a $1,000 loan with interest.

In contrast to the Medallion total electric home advertisement campaigns, little attention has been paid to total energy systems which for large users (apartment complex, high rise office, industrial park, etc.) are far more efficient than any system based on purchased electricity. In a total energy system electric generation waste heat may be used for a multitude of purposes including space heating, hot water, process steam, and machine operation. Efficiencies of 50%-80% have been obtained from on-site total energy systems. Such systems, if owned and operated by the consumer, are basically "anti-utility" and perhaps not surprisingly their development has been slow and erratic.

When considering the use of energy by all sectors of the economy, the design of a building has effects distinct from the operational requirements discussed. It has been estimated that the production, transportation and installation of construction materials represents 12% of the total industrial energy consumption. The energy requirements for the production and fabrication of the materials used in a building may vary widely. The decision to use aluminum instead of stainless steel in a curtain wall high rise will result in an increased energy use on the order of millions of kwhrs. (3) Energy intensive materials such as concrete and steel are often used inefficiently and the confused state of building codes may be in for much of the blame. The National Building Code specifies a safety margin of three for the load carrying concrete beams of a school. Standard design, however, already allows for three times the maximum load expected and, further, concrete strengthens with age. For other structures, the American Concrete Institute's National Code specifies lower safety design factors for concrete than for steel (making it cheaper to build with) and other codes in use frequently require different safety standards for the two materials. Safety standards of this sort are obviously rather arbitrary and, as in other aspects of design, their rational modification might result in extensive reduction of material use. This is not to suggest that safety standards be uniformly reduced. Perhaps the requirements for schools are not excessive. The problem, however, has not been well considered and special interests have played a considerable role in determining existing standards.

Another class of second and higher order design

effects are those of the local impact of a structure. What load will a building place on municipal facilities -- transportation, garbage disposal, waste treatment, electric supply capabilities and others -- and to what degree can these effects be beneficially and purposely modified through design. For example, the social costs associated with the increased road maintainance expense and air pollution burden from increased auto use must be compared to the costs of a new mass transit system. Unfortunately the mechanics required to determine and equitably allocate such costs are lacking. These effects increase rapidly in significance as the size of the system being designed increases. If, for example, the electric load needs cannot be met by expanding the capability of existing power plants, the construction of a new plant with attendant financing and siting problems will be required. Similarly, these effects grow in importance as any parameter of the system approaches "saturation" -- the ability of transportation networks to provide fuel, the ability of the environment to disperse wastes, or the availability of certain resources (such as copper for water pipes and wire).

Power use(and misuses) patterns in this country are not an anomoly despite the present focus on them. They are part of an economy based on wasteful production, careless design, planned obsolescence, and a lack of concern for the reuse of valuable resources or the control of poisons and wastes.

Despite the statements of the electric industry "stressing the importance of electricity as a status symbol among nations of the world (and) point(ing) out that the U.S. leads all other nations in the production of electric power," and despite their preying upon the ever abusable patriotic instincts of Americans to justify increased growth sufficient to "stay ahead of the Russians"; the correlation of energy use to standard of living is unclear. (15) The commercial per capita energy consumption has been plotted versus GNP for a number of countries and, though a strong positive correlation exists a factor of two separates many countries with similar GNPs. Unfortunately this only helps a bit, by implying the existence of large differences in the efficiency and intensiveness of energy use, and basically just transfers the confusion to the relationship between GNP and standard of living.

Surprisingly the efficiency of energy use of industrial nations does not seem to reflect technological development as much as it does the reliance on the inefficient gasoline internal combustion engine. More efficient use of energy, more rational resource utilization (recycling aluminum, steel etc.) and more efficient transportation systems would decrease our energy consumption significantly (30%-50%) without decreasing our standard of living and would quite certainly improve the quality of our environment. (16, 17)

A Rand study recently conducted for the California legislature "claims that...by the year 2000, use of electricity in the state might be reduced by as much as 430 billion kwhr annually through conservation policies, a 50% reduction in the demand projected by conventional methods. These savings would reduce the need for new power plants from an estimated 127 to 45 or less. Environmental damage from power generation would also be reduced... but only relatively minor dislocations would occur and the growth of the state's economy would not be affected." (11)

The most serious problem facing any attempt to reduce the energy consumed by the construction industry is motivation rather than technical inability. The present means of financing construction represents the largest single obstacle to the improvement of building techniques and, therefore, the improvement of building use characteristics. Most builders are more concerned with building fast in order to reduce their interest payments than they are in building well. Many one family home developments are arranged and designed mostly to speed construction.

There is a definite time lag between economic changes and adjustments by the construction industry. Present consumption patterns of the industry are based as much on habit as on economics, and it seems unlikely that there will be a widespread acceptance or rapid implementation of existing technologies or acceptance of new technologies as they are demonstrated.

Despite my efforts to justify many energy saving techniques by economic arguments, such considerations are extremely limited. The economic environment within which a corporation operates is not God given but is determined by government through laws, taxes control of securities and such a basic thing as maintainance of a currency. The limited scope of industrial decision making should not be allowed to place an unnecessary burden on society. If social costs are not included in the ledger books of industry, laws, taxes and other forms of regulation should be used to place economic constraints upon or to otherwise penalize businesses pursuing activities in a manner deemed undesirable by the majority of people. Unfortunately no national energy policy representing the interests of American consumers, upon which these economic constraints might be based has ever been formulated.

New technologies which increase construction costs but decrease energy use will not be adopted unless life cost design can be required or economically motivated. As stated in a recent Princeton report on a residential planned community, "Innovative technologies have an element of risk, thus, standard design, construction and the most commonplace solutions to heating and cooling were deployed ....Opportunities in design innovation...were inhibited in part for reason of cost, because of archaic building codes and attitudes of the public authorities towards site tailored energy systems." (18)

Building codes might be modified to require more rationally determined thermal characteristics. Such code requirements would be of particular value in dealing with those problems such as insulation of one family homes for which the economic savings/unit will be small although the total energy savings will be very large.

Tax rates and government mortgage terms might be

based on life costs of a structure, or have a component inversely proportional to efficiency of energy use or they might be tied to local municipality costs associated with inefficient energy use.

Flattening of inversion of electric utility rates so that the small user no longer subsidizes the large user -- as is now frequently the case -- would provide an incentive to reduce energy consumption. (11)

The construction industry is only one of many in which large fuel savings are possible even with minimal effort. It is a highly visible industry and has attracted more attention than most any other. Such attention is largely consumer directed. Buildings and cars in existence can be used somewhat more efficiently. Redesign is necessary for any long range impact. The immediate and midrange savings in other industrial production processes are even larger than those obtainable from the modification of use patterns of those buildings in existence.

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2. "Technical Options for Energy Conservation in Buildings"; NBS Technical Note #789, July 1973 Valuable Overview.

3. "Report of Ad Hoc Committee on Energy Efficiency in Large Buildings ..."; The State of New York; 1973.

4. "Guide and Data Books"; American Society of Heating, Refrigeration, and Air-Conditioning Engineers.

5. "Insulation Manual-Homes and Apartments"; NAHB Research Foundation, Inc. 1971.

6. "The Value of Thermal Insulation in Residential Construction ..." J.C. Moyers; Oak Ridge; 1971. An attempt to calculate the economic benefit of insulation to the homeowner. Does not arrive at an optimum except for Atlanta Area. Elsewhere the maximum insulation levels considered are still below the "optimum" although described as such.

7. "Energy Conservation in Housing: First Year Progress Report"; Princeton CES Report #6;1973.

8. "Architectural Energy Drain"; J. Stein, Smithsonian, 1973.

9. Building Research Translation; NBS.

10. "The Use of Solar Heating for Residential Space Heating"; H. Lorsch; Energy Conversion Vol. 13; 1973.

11. "Energy and the Future"; AAAS; 1973.

12. "Initiatives in Energy Conservation"; B. I. Hyman; Report,Committee on Commerce, U.S. Senate; 1973.

13. "Energy Policy Making"; I.L.White; Bulletin of Atomic Scientists; October, 1971.

14. "Residential Energy Consumption"; Hittman Associates; HUD-HAI-1; 1972.

15. Bulletin of The Edison Electric Institute; Vol.28, 1960, and Vol. 37, 1969.

16. "The Economic Geography of Energy"; D. Luten; Scientific American, September, 1971.

17. "The Flow of Energy in an Industrial Society"; E.Cook, Scientific American, September 1971.

18. "An Analysis of the Development Process in a Residential Community"; Fraker and Schorske; Princeton CES Report #5, 1973 Part of a quantitative study being conducted of a planned community in N.J. Based on interviews with the Developer, Utilities marketing staff, Architects, etc.

ENERGY SLIDE SHOW

Inspired by the effectiveness of the NARMIC Air War Slide Show, which we have automated and shown, we are now working on developing a slide presentation on the general subject of energy.

We welcome help from anyone with slides and ideas.

We also look forward to exchanging slides and ideas with other movement groups.

ALTERNATIVE SOURCES OF ENERGY

Alternative Sources of Energy is a magazine for people concerned with the development of alternative or "new" sources of energy, particularly solar, wind and water power.

The latest Feb. 1974 issue is bigger and better than ever: full of articles, information, references, lists of other news letters and "how to" pieces.

Six issues for $5 from Don Marier, Route 2, Box 90-A, Milaca, Minn. 56353.

Scanning the Establishment Press:

"Avoid Lay-Off by Running the Rat-Race Faster" Professor Advises Working Engineers

P.H. Thompson, an organizational behavior professor at Brigham Young University in Utah, recently published a piece in the IEEE Spectrum[1] on engineer lay-offs and what engineers can do to protect themselves.

Professor Thompson discovered that, initially, the major factor in lay-offs was the engineer's performance -- the better performers survived longer -- but that in major cutbacks, "...the company decided to lay off whole departments...the best engineer...--as well as the worst -- was laid off."

Professor Thompson found that an engineer's performance depended on a number of factors: "Clearly, if you are putting in more hours than your colleagues and producing a substantially greater yield, you're less likely to be laid off. But of all the factors examined, the complexity of the assigned job showed the most significant relationship to the person's being retained."

Professor Thompson suggested that engineers cope with the lay-off problem by analyzing "both the organization he may choose to work for and the role he may choose to play to make as certain as possible a continuing need for his skills.... The smart engineer will...plan a career that will be most likely to withstand the instability of the engineering industry..."

Suppose we look at Professor Thompson's last point first. An analysis of a company's policies toward engineers predicates a knowledge of those policies Although a number of engineering societies -- ASCE, ASME, etc. -- have published a set of 'Guidelines' for engineer employment, not a single U.S. firm has yet publicly stated details of its policies on the subject. To date, not one firm has openly revealed its practices on such mundane questions as starting pay of U.S. versus foreign-born engineers, number of paid holidays per year, pension portability, paid time off for advanced schooling, vacation time per year, lay-off practice. In the absence of such data, it is hard to see how engineers can perform Prof. Thompson's analysis. Yet nowhere does Prof. Thompson suggest that companies release this information.

Actually, engineers badly need a Truth-In Hiring program. Without such a program, companies can easily mislead prospective employees. Some years ago the writer was interviewed for a job by a well-known firm's personnel agent. The personnel man assured me that "the company has never had a mass lay-off." Three months after moving my family 400 miles for the job, I learned that the company's man lied outright; I had no recourse whatever. Lacking published Truth-In-Hiring information, nothing now impedes the same practice.

Prof. Thompson's appeal for better engineer's performance through greater yield via longer hours and eagerness to accept greater job responsibility can only result in dog-eat-dog competition among engineers. But most engineering work now requires sizeable teams; the cut-throat competition Prof. Thompson envisages destroys the cooperative spirit indispensable for a team effort. In one local firm which practices Prof. Thompson's doctrine, engineers are neurotic for fear of the slightest mistake that associates can use against them. And, in the absence of a cooperative team attitude, the firm has acquired an outstanding record of one-shot clients who never willingly return.

Prof. Thompson pretends to accept company performance ratings of engineers unquestioningly. As a rule, engineers never see these ratings. Nothing therefore prevents the ratings from reflecting internal company politics and prejudice rather than reality.

On the key question of companies' illegal discrimination against older engineers, Prof. Thompson, holder of a PhD from the Harvard Graduate School of Business Administration and formerly Assistant Professor there, becomes puzzled: "Why were the older groups at the same performance level so much more likely to be laid off? One factor may be that the companies wanted to retain younger people...Another factor is salary..." Apparently, Prof. Thompson does not know that many company pension schemes make it profitable to fire older engineers as they approach the point where they have a vested interest in retirement pensions. Getting rid of these engineers means that the company transfers their share of the tax-free pension contributions to the account of the companies' highly paid executives. Also, older engineers are probably less likely than new graduates to do two men's work for one man's pay in the competitive rat race which Prof. Thompson so admires.

Engineers are currently faced with serious problems:

1. Importation of thousands of foreign born engineers to keep U.S. pay rates down
2. Fraudulent pension schemes which encourage discard of older men
3. Misleading or lying hiring practices
4. Pressure for self-funded additional study upon employee engineers already desperately short of time and money
5. Starvation level unemployment insurance pay rates

As with other problems, these are capable of solution if subjected to an engineering examination of all pertinent facts followed by pressure from engineers' unions. With his Business Administration PhD, Professor Thompson may be incapable of understanding such an engineering approach. Or possibly, it pays better not to understand.

REFERENCES

1. IEEE SPECTRUM, December 1973, "Who Gets Laid Off", p.68.

How to Lie With Statistics:

University of Illinois College of Engineering Contribution

Under the head "Engineer Salaries Increase 167% in 10 years," ("Machine Design," January 10, 1974,) the University of Illinois College of Engineering reports that a survey shows that their graduates of '63 who then earned $596 per month now, after ten years, "average $1590 per month - up 167%." The College placement office also reports that the "top two salaries in the ... class of '63 are now $4300 and $4000 per month, by civil and industrial engineers, respectively..."

The essence of the engineering approach to a problem is to consider all factors involved, positive as well as negative, in reaching a conclusion. From this point of view, the University of Illinois publicity release omits a number of important factors:

1. How much value has the dollar lost in the last ten years? If the loss equals or exceeds 167%, engineers' real pay may have remained stationary or even declined.

2. Was the sampling proper? How many '63 graduates were polled? How many responded? Did those who failed to respond leave engineering altogether? Why?

3. Pay is only one - albeit an important one - element in engineers" compensation.As compared with 1963,
   (a) Do engineers get more holidays?
   (b) Do they get longer vacations?
   (c) Do they get company - paid time off for advanced study?
   (d) Are their pension rights transferable from one employer to another?
   (e) What severance pay do they get if laid-off?
   (f) Since highest pay rates are shown, what are the lowest pay rates?

The administrators of the University of Illinois College of Engineering know that an informed judgement and the status of engineers in '73 as compared with '63 is not possible in the absence of answers to these questions.

Why does the College of Engineering release a falsely glowing report on engineers' standing? Some facts and conjectures:

1. Enrollment in engineering colleges has been dropping both as a percentage of total total freshmen registered, and in absolute numbers.

2. Reason for the decline is the mistreatment of engineers via lay-off without severance pay, skimped time off, fraudulent pension schemes, miserable pay, among others.

3. Faced with the registration drop, engineer college deans want to reverse the trend to keep their plants from declining. A complete discussion would often suggest remedies. But such a discussion runs counter to the cash interests of the fat cats who run engineering companies and who sit on the engineer college boards. So the engineer college deans present a partial set of figures in order to create a misleading impression among prospective customer-students. More bluntly, they lie with statistics.

On the History of American Engineers

by Carroll Pursell

Engineers have, in the past, not been particularly interested in their own history, except to celebrate the clear and heroic upward ascent from the primal slime to ultimate perfection. By and large, however, the record of the past is considered a museum of errors or, at best, picturesque but false starts, interspersed with remarkable visions of a better future. It was long ago said that those who ignore their history are doomed to repeat it. We are all, to some extent, the product of our past, however, and those who realize this fact are better prepared to shape their own future.

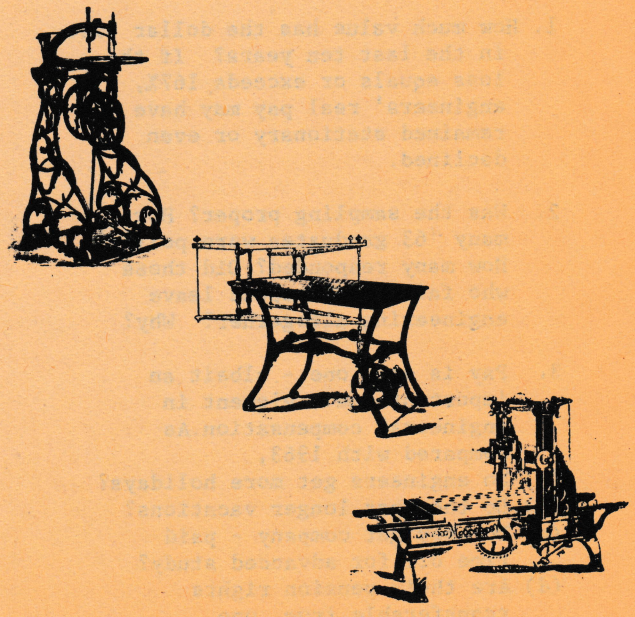
The history of American engineers has yet to be written, but several books are now available which point to the general parameters of that eventual study. The longest with us is Daniel H. Calhoun, THE AMERICAN CIVIL ENGINEER: ORIGINS AND CONFLICT (Cambridge: The Technology Press, MIT, 1960). Calhoun carries the story only up to the mid-nineteenth century, but since all engineers were once civil (that is, not military), his work covers the origins of the entire profession in the United States. As late as 1813 it was said that civil engineers were a "class of men almost peculiar to England," but soon the demand for canals and railroads multiplied their number in this country. A major finding of Calhoun's work is that despite dreams of independent status as consultants, civil engineers were from the beginning bureaucrats, subject to hiring and firing according to the needs of the corporation employing them.

The nation's civil engineers organized their professional society (ASCE) in 1852, but in 1871 mining engineers became the first group to break away and form a specialized society of their own, the AIME. A history of this profession is provided by Clark C. Spence in his book, MINING ENGINEERING & THE AMERICAN WEST: THE LACE-BOOT BRIGADE, 1840-1933 (New Haven: Yale Univ. Press, 1970). Largely laudatory in tone, Spence's book documents the two signal contributions of mining engineers to American society--the Daiquiri and the "rationalization" of the mineral industry.

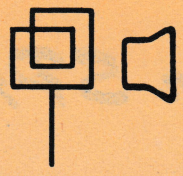
The second group to break away from the previously undifferentiated body of "civil engineers" was the mechanical engineers, who formed their own society (the ASME) in 1880. The evolution of this group is covered in Monte A. Calvert, THE MECHANICAL ENGINEER IN AMERICA, 1830-1910: PROFESSIONAL CULTURES IN CONFLICT (Baltimore: Johns Hopkins Press, 1967). The two cultures were those of the engineering schools and of the shop. For years the tension between academics and the managers of going concerns was evident in the ASME, and led to charges that the professional society was, in fact, dancing to the tune of the capitalist-engineers who not only financed it, but kept it within bounds which did not threaten either their profits or their hegemony in the profession.

Unfortunately other important groups, such as the electrical and chemical engineers, do not have their histories as well documented, but two other books investigate special aspects of the history of engineers in general. One, ENGINEERING IN AMERICAN SOCIETY, 1850-1875 (Lexington: Univ. of Kentucky Press, 1969) by Raymond H. Merritt, covers such topics as the engineer as professional, intellectual, executive, cosmopolitan, and manipulator of nature. His chapter on "Engineering and Urbanization" remains a provocative introduction to a subject still too little studied.

For the purposes of the CSRE perhaps the most important book is Edwin T. Layton, Jr., THE REVOLT OF THE ENGINEERS: SOCIAL RESPONSIBILITY AND THE AMERICAN ENGINEERING PROFESSION (Cleveland: Case Western Reserve Press, 1971). The time period covered by the book is mainly the first four decades of this century, and the concluding bibliographic essay is extremely comprehensive. (A review of Layton's book will appear in a subsequent issue of SPARK.)



Requests for Help



Dear friends,

Erie County, Pa., is on the verge of building an expensive new County Jail.

We in the Pax Center (A Christian Center For Non-Violence) are trying to STOP the construction of the new jail, because it is conceptually obsolete--just new cages, basically. We want to promote the community-treatment or group-home concept instead.

1. Do you know of any STUDIES or REPORTS (preferably from "establishment" or government sources) which call for a moratorium on the construction of new jails?

2. Do you know of any community correction alternatives which have been more sucessful (whatever that means) than the traditional jails?

3. Have you heard of any community groups like ourselves which have sucessfully blocked the construction of a new jail? How did they do it?

4. Is there any group of "socially responsible" ARCHITECTS that you know of, which might give us free technical advice on how to criticize the existing jail plans?

We would appreciate any help you can give us. If you can put us in touch with any other groups which might be able to advise us, that would be good.

Thank you:

For justice,
Juli Loesch
Prison Welfare Committee/
Pax Center

345 East ninth St.
Erie, Penn.16503

Dear CSRE Folks,

I am an electrical engineer seeking employment in an area of work that would combine my three areas of interest: education, technology, and development. After graduation from Virginia Polytechnic Institute and State University, I took a job with the American Freedom From Hunger Foundation, knowing that most employers of engineers interviewing at the college represented firms whose work was against my moral and ethical persuasion.

I worked for a couple of years with the Foundation organizing college and high school students around development issues, and helping them to start direct action programs in their communities. Now, I wish to use both my experience in development and education, and my academic skills acquired through my schooling. Again, I have searched and found the same employers of engineers, doing the same things with the same social conscience, or lack of it.

I am writing you in hopes that you have come across this kind of circumstance before, and would know which direction to point me. The salary is of very little importance, and my needs are not great, having become used to subsistence living.

My eventual goal is to help start or run a weekend school which would deal with the social and ethical problems of engineers and scientists working in the large corporations. I have long felt that folks can work out their own problems, given a relaxing place to meet, and a few "experts" in the problem areas they would be discussing. My education philosophy is similar to that of Highlander Research and Education Center, if you are familiar with their work with poor folk of Appalachia.

But right now I am just looking for employment that will give me a chance to use my acquired skills, and which will give me a free conscience. I am very much interested in working as a technical consultant to projects in developing countries which are humanitarian and not interest invested. If you know of any of this type of project which could use my skills I would be appreciative to hear of them.

I have been familiar with your work for the last year and have been quite impressed with it. It is good to see some support of the ideas which I literally had no support for in school, and in fact got branded for at the university.

I appreciate any help you can give me and am anxiously awaiting your reply.

Justice, then peace,
Doug Miller
107 Driftwood Drive
Long Beach, Mississippi 39560

Dear SPARK

Dear Friends,

The enclosed contribution derives from funds which were won as the result of a lawsuit against the University of California's Lawrence Radiation Laboratory. The court found that I had been denied employment by the Laboratory because of my "constitutionally protected political activities", which amounted to organizing noon hour meetings among fellow employees to discuss the relations of science with politics and speaking openly against the military programs of the Laboratory's funding agency, the U.S. Atomic Energy Commission.

In tune with the philosophy which got me into, and carried me through to victory in this little battle, I am distributing the net proceeds to a number of progressive organizations, most of which I have had contact with in the past. I trust that you will be able to put this share to creative good use.

Sincerely,
Charles Schwartz

Ed's note: For background information see:

1. "Free Speech" Figure Wins Compensation", Science, March 16, 1973, pg. 111.

2. "SESPA Activist Wins Court Case", Science for the People, May 1973, pg. 45.

3. "Free Speech or Defiance, Another Seminar at UC Rad Lab, San Francisco Chronicle, July 10, 1970.

Dear Friends,

We are very broke but managed to come up with a small contribution because we like what you are doing. Also enclosed are the names and addresses of local papers and radio stations that could benefit from a subscription to your publication.

Georgia Tech, in particular, may be receptive since during the past year they sponsored a speech by Abbie Hoffman, ran a Free University, a Public Interest Research Group, and several other heartening organiztions.

Yours,
Peoples Yellow Pages
570 Candler St.
Atlanta, Ga. 30307

Dear Comrades,

I find each issue of SPARK better than the last. The artice on the history of engineering unions in your Fall '73 issue was particularly important and I thought well written. It gave a lot of good historical information and I liked its focus on the relationship of engineers to blue- collar workers, showing that they really have tremendous common interests, in spite of efforts of management to pit them one against another with concepts such as "professionalism." From everything I've ever seen, the concept of professionalism has always been used to discourage the organizing of engineers by giving them this false consciousness about who they really are and what they really do. The job insecurity, unpaid overtime, and the cut-throat competition for work that typify the work of an engineer have been struggled against and largely mitigated for "unprofessional workers." Engineers have the privilege of still being plagued by such conditions. I think that SPARK can play an important role in demystifying professionalism, in showing what it really stands for, and in informing people of progressive organizing efforts among engineers.

In struggle,
Al Weinrub
SESPA/Science for the People

Ed Note. Enclosed with Al's letter were copies of the following three articles that have been published in Science for the People magazine. Back issues of the magazine are available from SCIENCE FOR THE PEOPLE, 9 Walden St., Jamaica Plain, Mass. 02130.

1. "Engineers in the Working Class", Science for the People, Sept. 1971, pg. 9-13.

2. "Engineering Unemployment or How to Lie With Statistics", Science for the People, March 1973, pg. 43-44.

3. "Engineers: An Examination of Some Myths and Contradictions Concerning Engineers," Science for the People, May 1973, pg. 16-20.

Dear Friends,

I received the fall, 1973 issue of Spark, and I want simply to say this is a very fine issue of the magazine.

With best wishes.

Sincerely yours,
Seymour Melman

Dear CSRE,

I am writing to you on behalf of Social Responsibility in Science, a group at La Trobe University in Melbourne, Australia which has objectives similar to those of CSRE. (We will add "and engineering" to our name when we get an Engineering faculty at La Trobe.)

Recently we made contact with SESPA, which sent us copies of SPARK as well as their own publications. We want to distribute CSRE publica- at La Trobe. Please send us...

I also enclose copies of our own publication FIRE. I hope this is only the beginning of communication and solidarity between our two groups.

Yours sincerely,
Julian Shaw
Social Responsibility
in Science
La Trobe University
Bundoora 3083
Victoria, Australia

Dear Friends,

We are starting a Cincinnati office of Vocations for Social Change (VSC). As you probably know, VSC is a nationwide network of groups dedicated to helping people find a way out of the consumeristic/capitalistic system and create liberated lifestyles for themselves which allow them to live and work for social change.

Part of our facility will be a reading room with periodicals, books and literature on the Movement and alternatives. We would like to receive Spark. Unfortunately, we are not a funded organization and cannot offer to pay for it. However, can offer you a wide audience, dissemination of your information, publicity, etc. Thanks for your cooperation.

Peace,
Joel Stevens for VSC
Vocations for Social Change
1314 Race St.
Cincinnati, Ohio 45210

Dear People,

We are very much interested in your committee's work. We would like to receive SPARK but are only able to pay.....

Thank you very much,
OPT-Vocations for
Social Change
Box 4752 Duke Station
Durham, N.C. 27706

SCIENCE FICTION INQUIRY

A life long science fiction reader is interested in studying the extent to which the goals and values of engineers and technicians are reflected in their most utopian form; science fiction.

He would like:

1. some informed guesses as to how many technicians and engineers are also consistent science fiction fans;
2. references to surveys which might have been made on the subject;
3. estimates of the percentage of engineers affected by the science fiction mania.

write: Neal F. Wilgus
S.S.Rte. Box 175A
Corrales, N.M. 87048

WHY DO WE SPEND SO MUCH MONEY?

This well written pamphlet of questions and answers takes a critical look at the responsibility of corporate and government machinery for the high costs of housing, food, transportation, clothing, medical care and education. 48 pgs. 90¢ plus mailing from Popular Economics Press, 5A Putnam St., Somerville, Mass. 02143.

SRRT OF THE ALA

The Social Responsibilities Round Table (SRRT) of the American Library Association (ALA) publishes a bimonthly newsletter covering the movement for social change within the library field.

For more information contact:
Sanford Berman
Cataloging Secion
Hennepin County Library
York Ave. South at 70th
Edina, Minn. 55435

Juan Flandes, a 25 year old engineering student at the University of Los Angeles in Chile, has been detained without trial ever since his arrest shortly after the Sept. 11, 1973 military coup in Chile. He is accused of leading guerilla activity in Southern Chile.

To aid in obtaining Juan's release, the US Committee for Justice to Latin American Political Prisoners suggests writing letters to:

Col. Alfredo Rehren Pulido
Intendente de La Provencia de Bio Bio
Los Angele, Chiles, Chile.

The military head of the prison states Juan is in good condition, but his father reports he has not been allowed to visit with Juan.

CSRE is collecting information on other engineering victims of the Chilean military coup. The Universidad Tecnica in Santiago was among the places hardest hit by the military during the coup. Reports indicate many deaths, (estimates range up to 500 dead) and arrests among engineering students and faculty. If willing to work with us for their release, please write us.

Dale Petty, former president of the IEEE Student Branch at the University of Buffalo, goes on trial April 17, 1974 in Fresno, California for refusing to accept alternative service with the Selective Service System.

CSRE has sent a mailing to most of the IEEE Student Branches in the United States seeking support for Dale's struggle. We have been encouraged by the response to date.

For instance, from the University of Maryland came the comment, "The government has screwed too many people who refused to remain silent already. I am not in the habit of making contributions but Dale probably needs it."

The Fall 1973 issue of Spark carried extractions from a paper Dale wrote that gives a good background into the basis from which he has decided to resist the Selective Service System.

For further information on Dale's case, please write us.

Automated Exhibit of the Continuing War

Officially, U.S. military activity in Indochina has come to a halt. In reality the Indochina War, supported by the U.S., continues.

The most intensive bombing in history and occupation by an American force of 500,000 men has left deep scars on the land and people of Vietnam. The NARMIC slide show documents military-industrial partnership in the development of America's air war arsenal and the use of highly sophisticated electronic and anti-personnel weaponry against a largely peasant population.

With minor editing to reflect recent developments, the approximately 140 color slides and accompanying 1/2 hour narration present a lucid, forceful account of a portion of recent U.S. history; material not disseminated through the mass media but with an important message for all Americans. CSRE's belief in the particular significance of this exhibit at the present time of rising U.S. military budgets and post war recovery efforts in Indochina, lead us to make available an edited version of the original show. A description of the automated projection equipment follows.

CSRE has assembled equipment for automatic, continuous showing of the NARMIC Air War Slide Show. We are prepared to loan this equipment for use at conventions, conferences, exhibits, lunchrooms, lobbies, corridors, storefronts or any place that it might help catch the eye of passersby.

The slides are viewed on a table top rear projection screen with 22 inch diagonal. A stereo tape unit has the narration on one channel while the other channel controls the slide projector. By recording on a 40 minute "8 track stereo cartridge", we get a playback system that repeats every 40 minutes without rewinding, since a tape cartridge contains an endless loop of tape. At the same time that the tape is ready to repeat, the 140 slides of the NARMIC slide show have returned to the starting position of their 140 slide capacity carousel.

We have built two types of control units. Both synchronize the slide advance with the narration; the more complex unit also controls the intensity of the projector bulb.

We are prepared to loan a pre-recorded cartridge and a basic control unit, both of which can be conveniently mailed. This assumes that the borrower provides: 1)a set of the NARMIC slides; 2)a carousel projector; 3)a cartridge playback unit and one speaker; 4)a projection screen, either rear view or direct view.

If transportation can be conveniently arranged, we are prepared to loan our complete system. We would prefer though to keep the set of slides and our projector so that we can continue to give single showings while the rest of the equipment is out on loan.

Committee for Social Responsibility in Engineering

475 Riverside Drive, New York, N.Y. 10027

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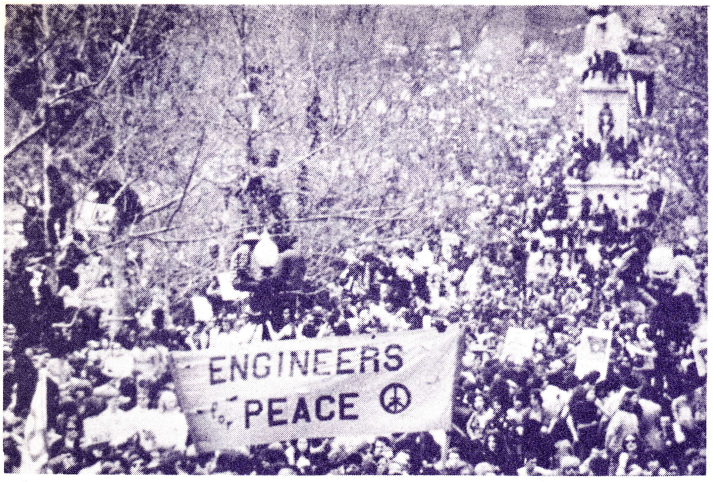

We feel that both CSRE and SPARK must serve the needs of its supporters. If you like what we are trying to do, please, help us with financial support so that we can proceed. If you are in general agreement with us and consider yourself a member, fine. If you have doubts, but want to maintain contact, fine also. In any case please send us the following:

NAME
ADDRESS and ZIP CODE

If you would like us to put you in touch with other members in your area, please indicate and include your occupation (affiliation).

DUES: $10 annual; unemployed $2;
student $5; broke $1;
affluent more than $10.

Let us know how many magazines you could help us sell on consignment.

Send us the names and addresses of people you think would like to receive a complementary copy.

Send advice, comments, ideas, articles, or news of what happening where you are. This is the best way to get to know each other.

When submitting articles for publication please try to conform to the magazine format.

---------- C.S.R.E., 475 Riverside Drive; New York, N.Y. 10027 ----------

Please enroll me as a MEMBER in THE COMMITTEE FOR SOCIAL RESPONSIBILITY IN ENGINEERING: __$10 Annual Membership. ___Other (see above).

Please send me __ "Social Responsibility in Engineering" buttons @ 25¢ each.

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